This is the accepted manuscript of an article to be published in Management Science. A permalink for the final published version will be provided when available.

The Effect of Managers on Systematic Risk*

Antoinette Schoar
Massachusetts Institute of Technology
aschoar@mit.edu

Kelvin Yeung
City University of Hong Kong
kksyeung@cityu.edu.hk

Luo Zuo
Cornell University
luozuo@cornell.edu

July 2022

Management Science, Forthcoming

ABSTRACT

Tracking the movement of top managers across firms, we document the importance of manager-specific fixed effects in explaining heterogeneity in firm exposures to systematic risk. In equilibrium, manager fixed effects on systematic risk are positively related with manager fixed effects on stock returns. These differences in systematic risk are partially explained by managers' corporate strategies, such as their preferences for internal growth and financial conservatism. Managers' early-career experiences of starting their first job in a recession also contribute to differential loadings on systematic risk. These effects are more pronounced when managers wield more influence, as in smaller firms and firms that do not have an independent board. Overall, our results suggest that managers play an important role in shaping a firm's systematic risk.

Keywords: Manager Fixed Effects, Systematic Risk, Managerial Style.

JEL Classification: G12, G30.

* We appreciate the helpful comments of Victoria Ivashina (editor), the anonymous associate editor, the two anonymous reviewers, Sanjeev Bhojraj, Robert Bloomfield, Ivor Cribben, Radhakrishnan Gopalan, Toomas Laarits, Pavel Savor, and Eric Yeung, as well as seminar participants at Cornell University, the 2019 Conference on Financial Economics and Accounting, and the American Finance Association 2020 Annual Meeting. Schoar acknowledges financial support from the MIT Sloan School of Management. Yeung acknowledges financial support from City University of Hong Kong and the Cornell SC Johnson College of Business. Zuo acknowledges financial support from the Cornell SC Johnson College of Business and the University of Toronto Roger Martin Award for Emerging Leaders.

1 Introduction

A large literature in corporate finance has shown that top executives differ systematically in their management styles, and those differences account for a significant fraction of the variation in firms' real outcomes such as investment decisions, organizational structures, and capital structure. This heterogeneity in managerial styles has been shown to correlate with firm performance and the career experiences of executives.[1] Heterogeneity in top manager styles might also have implications for the firm's exposure to systematic and idiosyncratic risk. Several asset pricing papers model a firm as a portfolio of projects whose expected returns vary over time as new investment opportunities and asset turnovers change their riskiness (e.g., Berk, Green, and Naik 1999; Gomes, Kogan, and Zhang 2003; Carlson, Fisher, and Giammarino 2004; Livdan, Sapriza, and Zhang 2009). Here, managers make optimal investment decisions based on the existing investment opportunities. The resulting time-varying betas have been used to explain return anomalies such as the book-to-market factor without having to appeal to behavioral models or market mispricing.

In this paper, we build on this intuition and analyze whether changes in top managers persistently affect the risk exposures of firms. The heterogeneity in CEO styles documented by the prior literature might translate into differences in firms' risk exposures. Depending on the CEO's ability or preferences, some might have an advantage in identifying higher-risk and higher-return projects, while others may be better at finding lower-risk projects. A firm's risk exposures can be a function of how the existing portfolio of assets is managed, and a certain level and type of risk exposure can be achieved either by investing in new projects or by divesting old assets. As a result,

[1] See, for example, Bertrand and Schoar (2003), Malmendier and Tate (2005), or Bennedsen, Pérez-González, and Wolfenzon (2020) on the importance of CEOs for firm decisions. A related literature suggests that managers' personal traits and experiences play a role in shaping their management approach (e.g., Kaplan, Klebanov, and Sorensen 2012; Graham, Harvey, and Puri 2013; Benmelech and Frydman 2015).

CEOs who invest in low-beta projects will see a lower expected return going forward, and vice versa for CEOs who increase their firm's beta.

Typically, we cannot quantify these project-level choices within a firm or the changes in risk exposures that ensue at the project level. A large literature investigates the determinants of the systematic risk exposures of firms but has concluded that a large amount of their variation cannot be explained by firm-, industry-, or market-level variables alone.[2] However, if CEOs are centrally important in determining their firm's risk exposure, we can measure a firm's aggregate change in systematic risk (beta) as a function of the CEO's spell in the firm and her corporate strategy. Using the well-known identification strategy of executives switching firms, we first show that manager fixed effects play an important role in explaining changes in firm beta and, to a lesser degree, their idiosyncratic risk over time. Second, we show that executives who have higher beta fixed effects also have higher stock return fixed effects, on average, which suggests that this is an equilibrium phenomenon. Third, we confirm that manager fixed effects on beta are correlated with manager fixed effects on corporate strategies; for example, managers who load more heavily on capital expenditures also have higher fixed effects on beta. Fourth, we show that managers' early-career experiences shape their loading on systematic risk.[3] Finally, we analyze whether certain firm and market conditions moderate the effect of managers on beta.

We start from a single-factor market model to decompose stock return variability into systematic and idiosyncratic components. Total risk (*TVOL*) is the standard deviation of a firm's

---

[2] See, for example, Beaver, Kettler, and Scholes (1970), Hamada (1972), Breen and Lerner (1973), Rosenberg and McKibben (1973), Fisher (1974), Lev and Kunitzky (1974), Melicher (1974), Robichek and Cohn (1974), Ben-Zion and Shalit (1975), and Karolyi (1992). Ben-Zion and Shalit (1975) conclude that "a search for the 'missing variable' seems to be a worthwhile undertaking for future research, not only because an important determinant of risk might thus be identified, but also because in the process we may gain a better understanding of the different aspects of risk" (p. 1025).
[3] A strand of research suggests that managers' incentives shape their risk-taking behavior (see Section 2 for details). However, this literature does not focus on individual differences between managers. Instead, it assumes that different managers will make similar decisions when provided with the same incentives.

daily stock returns within its fiscal year. We estimate the market model using a one-year window with daily returns. Our measure of systematic risk (β_{MKT}) is the slope coefficient on the excess return of the market portfolio, and our measure of idiosyncratic risk ($IVOL$) is the standard deviation of the residuals. Although we focus on the single-index model, our results generalize to other empirical asset pricing models such as the Fama-French Six-Factor Model.[4]

Following Bertrand and Schoar (2003), we track the movement of managers across firms over time to disentangle manager fixed effects from firm fixed effects. We cannot separate manager fixed effects from firm fixed effects if, for example, a manager never switches firms and advances only through internal promotions. In our base model, we regress each measure of risk on firm fixed effects and year fixed effects. Then, we add manager fixed effects to our base model and examine whether the manager fixed effects have incremental explanatory power.[5] Intuitively, we test whether systematic risk is correlated across at least two firms when the same manager is present, controlling for time-invariant firm characteristics (firm fixed effects) and year-specific cross-sectional effects (year fixed effects).

Our results indicate that managerial style is an important determinant of systematic risk. When we add manager fixed effects to the model with β_{MKT} as the dependent variable, adjusted R^2 increases by 7.16 percentage points, which is equivalent to a 16.67 percent increase relative to the base model. For comparison, adjusted R^2 increases by 4.43 percentage points when we use $IVOL$ as the dependent variable, and adjusted R^2 increases by 4.56 percentage points when we use

[4] We focus on market beta due to its strong theoretical roots (Sharpe 1964; Lintner 1965) and its widespread use in practice. Berk and van Binsbergen (2016) find that the Capital Asset Pricing Model (CAPM) is the dominant model used by mutual fund investors to make their capital allocation decisions. In addition, Graham and Harvey (2001) report that more than 70 percent of CFOs use the CAPM to calculate their cost of equity. Dessaint, Olivier, Otto, and Thesmar (2021) provide systematic evidence on the real effects of using the CAPM in capital budgeting.

[5] This approach does not rule out the possibility that managers may develop their style over time or that the market may learn about a manager's style over her tenure (e.g., Pan, Wang, and Weisbach 2015). Manager fixed effects do not capture such a time-varying dimension of style.

$TVOL$ as the dependent variable. These increases in adjusted R^2 are equivalent to a 7.19 and 7.36 percent increase relative to the base model for $IVOL$ and $TVOL$, respectively. Furthermore, the frequency of significant manager fixed effects is far greater than would be expected under the null hypothesis that managerial style is not a determinant of systematic risk: 49.26 percent of the manager fixed effects are significant at the 10 percent level, 43.18 percent of the manager fixed effects are significant at the 5 percent level, and 35.01 percent of the manager fixed effects are significant at the 1 percent level. In terms of economic magnitude, hiring a manager at the 25th percentile of the distribution leads to a 0.201 decrease in β_{MKT}, and hiring a manager at the 75th percentile of the distribution leads to a 0.161 increase in β_{MKT}.

We next explore whether firms' stock returns are associated with manager fixed effects on systematic risk. More precisely, we argue that managers who have beta-decreasing styles should be associated with lower expected returns, and managers who have beta-increasing styles should be associated with higher expected returns. To shed light on this question, we proceed in two steps. First, we replace the dependent variable in our work-horse model with a firm's annual return during its fiscal year (RET). Second, we examine the association between manager fixed effects on RET and manager fixed effects on β_{MKT}. Our results indicate that manager fixed effects on RET are positively related to manager fixed effects on β_{MKT}. We do not find a significant association between manager fixed effects on RET and manager fixed effects on $IVOL$.

Two points are worth noting in interpreting our results. First, the documented managerial effects on a firm's systematic risk are not the causal effects of randomly assigning managers to firms. A manager's preferred level of systematic risk may be (at least partially) observable to the board before she is appointed. Therefore, a firm with a need for a certain level and type of risk exposure may seek a manager whose style fits its vision. For example, boards might prefer to hire beta-increasing managers when they expect a bull market and beta-decreasing managers when they expect a bear market. While we do not find evidence of such hiring patterns based on observables, we cannot rule out the possibility that the endogenous matching of firms and managers partly explains our results. Second, our sample focuses on external transitions – not internal promotions. It could be that managers who have strong beta styles are those who tend to move. Hence, we caution that our results may not generalize to managers who never switch firms.

To understand the channels through which top managers affect systematic risk, we analyze whether specific firm-level decisions that managers undertake translate into differential loadings on systematic risk. We first examine whether manager fixed effects on the real side of the firm, such as capital structure decisions and other firm policies, explain manager fixed effects on β_{MKT}. Bertrand and Schoar (2003) show that manager fixed effects are important for a number of corporate policy variables. We conduct a factor analysis, which shows that these manager fixed effects vary along three dimensions: internal growth, financial conservatism, and external growth. Manager fixed effects on β_{MKT} are positively related to managers' preferences for internal growth and negatively related to managers' preferences for financial conservatism, but they do not vary systematically with measures of external growth.[6]

In addition, we perform a dynamic analysis by tracking the evolution of beta and corporate policies in event-time surrounding executive transitions. When a firm hires a manager with a beta-increasing style, we observe an immediate and persistent increase in β_{MKT}. In contrast, when a firm hires a manager with a beta-decreasing style, we observe an immediate and persistent decrease in β_{MKT}. Turning to corporate policies, we find that beta-increasing managers lead to an immediate

[6] A caveat is that these documented relations are not necessarily causal.

and persistent increase in capital expenditures relative to beta-decreasing managers, consistent with our factor analysis.

To further analyze the importance of managerial strategies in explaining manager fixed effects on β_{MKT}, we rerun our regressions while directly controlling for time-varying firm characteristics. This specification directly absorbs changes on the real side of the firm that top managers might be undertaking. When we control for time-varying firm characteristics, adjusted R^2 increases by 6.86 percentage points (compared to 7.16 percentage points in the benchmark specification). Our results indicate that time-varying firm characteristics partially explain manager fixed effects on β_{MKT}. However, manager fixed effects have significant explanatory power after we control for these time-varying firm characteristics. The above results suggest that managers affect their firm's loading on systematic risk via the project-level choices they make, and a large amount of the variation in manager fixed effects on β_{MKT} is not captured in traditional corporate policy variables.

Similarly, by using unlevered betas (i.e., asset betas), we separate out the effect of the firm's capital structure and isolate the component of systematic risk due to the firm's assets. Adjusted R^2 increases by 6.06 percentage points, which is equivalent to a 13.98 percent increase relative to the base model. Our results indicate that manager fixed effects are an important determinant of unlevered beta, which confirms that managers influence the risk of their firm's underlying assets and not only the capital structure of their firm.

In the next step, we analyze whether observable manager characteristics explain manager fixed effects with respect to systematic risk. We find that manager fixed effects on β_{MKT} are related to managers' early-career experiences. On average, the signed effect on β_{MKT} is 0.240 smaller for managers who originally entered the labor market during recessions. These results are in line with the findings in Schoar and Zuo (2017) that managers who enter the labor market during recessions adopt more conservative corporate strategies, such as lower SG&A and reduced leverage. We do not find evidence that other characteristics like age or gender are related to manager fixed effects on β_{MKT}.

As a further robustness test, we analyze whether certain firm and market conditions moderate the effect of managers on beta. We find that manager fixed effects on β_{MKT} are more pronounced when managers are likely to have more influence over firm outcomes, as in smaller firms and firms that do not have an independent board. We also find some evidence that managers have more discretion in pursuing their strategic vision when a firm underperforms its peers in the year before an executive transition.

The rest of our paper is organized as follows. Section 2 reviews the related literature and discusses our paper's contributions. Section 3 describes our sample. Section 4 describes our measures of risk and presents descriptive statistics. Section 5 describes our methodology and presents our empirical results. Section 6 summarizes our findings and offers some concluding remarks.

2 Related Literature and Contributions

One of the key insights of asset pricing theory is that investors are rewarded for bearing systematic risk, but not idiosyncratic risk. To shed light on the sources of systematic risk, a large literature studies the fundamental determinants of beta. Early empirical work identified several firm-, industry-, and market-level determinants.[7] More recently, a strand of the literature models beta as a function of firm characteristics, including size, book-to-market, and financial leverage.

[7] See, for example, Beaver, Kettler, and Scholes (1970), Hamada (1972), Breen and Lerner (1973), Rosenberg and McKibben (1973), Fisher (1974), Lev and Kunitzky (1974), Melicher (1974), Robichek and Cohn (1974), Ben-Zion and Shalit (1975), and Karolyi (1992).

For example, Gomes, Kogan, and Zhang (2003) model a dynamic general equilibrium production economy that links beta with firm size and book-to-market. Size captures the importance of growth options relative to assets-in-place. Small firms derive most of their value from growth options, while large firms derive most of their value from assets-in-place. Since growth options are riskier than assets-in-place, small firms have higher beta. On the other hand, book-to-market is a measure of the risk associated with a firm's assets-in-place, which leads to a positive relation between beta and book-to-market. Carlson, Fisher, and Giammarino (2004) elaborate on the mechanism underlying this relation. High book-to-market firms have higher operating leverage (i.e., more fixed costs), which increases their sensitivity to aggregate demand shocks. Livdan, Sapriza, and Zhang (2009) study the relation between beta and financial leverage. Levered firms are riskier because financial constraints hinder their ability to adjust capital investments in response to aggregate demand shocks. We contribute to this literature by identifying managerial style as an important determinant of beta. Our paper differs from prior research in that we examine manager-specific differences rather than firm, industry, or market characteristics.

Our work also extends a growing body of research on management styles (see reviews in Malmendier (2018) and Hanlon, Yeung, and Zuo (2022)).[8] Bertrand and Schoar (2003) document that manager-specific styles explain a large fraction of the variation in firms' investment, financial, and organizational policies. In a similar vein, other studies have documented the importance of managerial style for tax avoidance (Dyreng, Hanlon, and Maydew 2010), voluntary disclosure (Bamber, Jiang, and Wang 2010), and financial reporting (Ge, Matsumoto, and Zhang 2011). Recently, Bennedsen, Pérez-González, and Wolfenzon (2020) used hospitalizations as an

[8]A large body of work in the strategic management literature argues that managers' unique experiences, values, and personalities influence how they respond to complex situations; see Hambrick and Mason (1984) or Hambrick (2007). First, a manager's field of vision is limited, and she might therefore operate with specific heuristics. Second, the information selected for processing is interpreted through a filter woven by the manager's cognitive frame.

exogenous source of variation in firms' exposures to their CEOs and showed that CEOs have significant effects on investment and profitability. A related strand of literature suggests that managers' styles are shaped by their personal traits, such as overconfidence (Malmendier and Tate 2005, 2008; Hirshleifer, Low, and Teoh 2012), political connections (Fan, Wong, and Zhang 2007), skills and expertise (Kaplan, Klebanov, and Sorensen 2012; Custódio and Metzger 2013, 2014), military service (Benmelech and Frydman 2015), marriage (Roussanov and Savor 2014), parenting a daughter (Cronqvist and Yu 2017), and formative experiences during childhood (Malmendier, Tate, and Yan 2011; Bernile, Bhagwat, and Rau 2016) and at the beginning their careers (Dittmar and Duchin 2015; Schoar and Zuo 2016, 2017).[9] We extend this line of work by documenting the importance of managerial style for firms' systematic risk exposures.[10]

Our work also complements prior research on how a CEO's compensation can influence her willingness to take risk. For example, option contracts can shape managerial risk-taking (e.g., Hall and Murphy 2003; Coles, Daniel, and Naveen 2006; Lewellen 2006; Armstrong and Vashishtha 2012; Hayes, Lemmon, and Qiu 2012; Shue and Townsend 2017; Kubick, Robinson, and Starks 2018). Since options have convex payoffs, they create incentives for managers to take risk. However, options also increase the sensitivity of a manager's wealth to her firm's stock price, which can lead a risk-averse manager to reduce firm risk. In addition, research suggests that observed compensation arrangements can arise as either the solution to an optimal contracting problem or the outcome of a governance problem where managers are paid for luck (Bertrand and

[9] In addition, recent research documents that individuals exhibit large differences in their expectations about future macroeconomic conditions, which influences their desire to invest in the stock market and purchase durable goods (e.g., Kuhnen and Miu 2017; Das, Kuhnen, and Nagel 2020).

[10] Prior research on CEO turnovers shows that CEOs can get fired after bad industry or market performance (Kaplan and Minton 2012; Jenter and Kanaan 2015). These results are interpreted as evidence suggesting that "CEOs are fired after bad firm performance caused by factors beyond their control" (Jenter and Kanaan 2015, p. 2155), which might be viewed as an optimal response of the board to changing industry or market conditions (Kaplan and Minton 2012). Our study differs from this line of work by focusing on a firm's systematic risk (i.e., beta) that is under a CEO's control.

Mullainathan 2001; Gormley, Matsa, and Milbourn 2013). Gopalan, Milbourn, and Song (2010) highlight the potential for CEO compensation to affect firm loadings on systematic risk. They propose that the optimal contract needs to provide incentives for managers to forecast sector movements and to choose a strategy that yields the optimal exposure to such movements. While this line of work in the compensation literature views managers as *Homo economicus* (economic beings) and highlights the role of firm-level mechanisms in shaping managers' risk-taking incentives, we view managers as *Homo sapiens* (human beings) and focus on managers' person-specific styles that are orthogonal to firm-level factors.[11]

3 Sample

Our sample begins with all executives covered by Execucomp between 1992 and 2016. Within the Execucomp universe, we identify managers who work in two or more firms ("movers").[12] In doing so, we require that movers work at least three years in each firm, giving these managers an opportunity to "imprint their mark."[13] If a firm employs a mover at any point during our sample period, we retain all of that firm's observations. Lastly, our sample excludes financial firms (SIC = 6) and utilities (SIC = 49).[14] The resulting sample includes 25,266 firm-year observations corresponding to 1,675 firms and 1,683 movers.[15]

---

[11] We use the terms *Homo economicus* and *Homo sapiens* in a similar spirit as Thaler (2000).

[12] Since 1994, Execucomp has tracked the top five highest-paid executives in the S&P 1500. Execucomp includes both incumbent firms and firms that were once part of the S&P 1500 but were later removed from the index. Before 1994, Execucomp's coverage was limited to the S&P 500. Our sample selection procedure excludes managers who move from an Execucomp firm to a non-Execucomp firm and vice versa. However, we do not believe that this sample selection issue limits the generalizability of our results, since the S&P 1500 covers approximately 90 percent of the U.S. market capitalization.

[13] Our inferences remain largely unchanged when we do not impose this restriction.

[14] Our results are qualitatively similar if we include these firms.

[15] Because our dependent variable is firm-specific rather than manager-specific, we do not include non-movers in the estimation. As noted in Graham, Li, and Qiu (2012), an alternative approach based on Abowd, Kramarz, and Margolis (1999) can be used to include non-movers and increase the precision of the model estimates when the dependent variable is manager-specific (e.g., executive compensation).

Table 1 summarizes the nature of executive transitions in our sample. We use three variables in Execucomp to code the position of a specific manager in a given firm: (1) *titleann*, (2) *ceoann*, and (3) *cfoann*. Following the prior literature (e.g., Jiang, Petroni, and Wang 2010), we use *ceoann* to identify CEOs.[16] For the sample period after and including 2006, we use *cfoann* to identify CFOs. For the sample period before 2006, we code a manager as CFO if *titleann* includes any of the following phrases: CFO, Chief Financial Officer, Treasurer, Controller, or Finance.[17]

A small subset of managers work at more than two firms: 131 managers (7.78 percent) work at three firms, 14 managers (0.83 percent) work at four firms, and 3 managers (0.18 percent) work at five firms. When a manager works at three or more firms (i.e., moves more than once), Table 1 reports the last move only. Therefore, the "to" positions in Table 1 can be interpreted as the last position held by each manager. Our sample contains 582 executives whose last position is CEO, 414 executives whose last position is CFO, and 687 executives whose last position is neither CEO nor CFO (i.e., Other). "Other" refers to miscellaneous job titles such as Chief Operating Officer, Corporate Secretary, General Counsel, and various subdivision Presidents or Vice-Presidents (e.g., human resources, research and development, and marketing). In our main analysis, we use these three categories to group manager fixed effects. Our analysis includes the top five executives instead of only CEOs and CFOs because the management literature has long noted that organizational outcomes are shaped by the entire top management team (e.g., Hambrick and Mason 1984; Finkelstein, Hambrick and Cannella 2009).

Our sample contains 214 executives who leave a CEO position, 440 executives who leave a CFO position, and 1,029 executives who leave a non-CEO, non-CFO position. Among the set of

[16] When a firm-year is not assigned a CEO (i.e., *ceoann* is missing), we assign a CEO using the variables *becameceo* and *leftofc*, if possible.
[17] The variables *ceoann* and *titleann* are available for the entire sample period; *cfoann* is not available before 2006.

executives who start as CEO, 132 become CEO at another firm, and 82 move to a non-CEO, non-CFO position at another firm. Among the set of executives who start as CFO, 41 become CEO at another firm, 340 become CFO at another firm, and 59 move to a non-CEO, non-CFO position at another firm. Lastly, among the set of executives who start in a non-CEO, non-CFO position, 409 become CEO at another firm, 74 become CFO at another firm, and 546 move to a non-CEO, non-CFO position at another firm.

We merge the firm-year panel described above with annual accounting variables from Compustat, merger and acquisition data from SDC Platinum, institutional holdings data from CDA/Spectrum, analyst coverage data from I/B/E/S, relative performance evaluation (RPE) data from Institutional Shareholder Services (ISS) Incentive Lab, board independence data from BoardEx, and volatilities calculated using daily stock returns from the Center for Research in Security Prices (CRSP).

4 Variable Definitions and Descriptive Statistics

4.1 Risk

The Capital Asset Pricing Model (CAPM) proposed by Sharpe (1964) and Lintner (1965) formalizes the relation between risk and expected returns. Specifically, the Sharpe-Lintner CAPM shows that if investors have homogenous expectations and hold mean-variance efficient portfolios (Markowitz 1959), then the market portfolio will itself be a mean-variance efficient portfolio. The efficiency of the market portfolio leads to the following equilibrium pricing relation:

$$E[R_i] = R_f + \beta_{im}\left(E[R_m] - R_f\right) \tag{1}$$

$$\beta_{im} = \frac{Cov(R_i, R_m)}{Var(R_m)}$$

where R_i is the return of asset i, R_f is the return of the risk-free asset, and R_m is the return of the market portfolio. The beta coefficient, β_{im}, measures the sensitivity of the return of asset *i* to that of the market portfolio. It has been widely adopted as a measure of systematic risk in security and portfolio analysis.

The Sharpe-Lintner CAPM is a one-period model. Thus, early studies often assumed that beta was time-invariant. However, empirical evidence challenges the veracity of this assumption (e.g., Bollerslev, Engle, and Wooldridge 1988; Harvey 1989; Jagannathan and Wang 1996). These studies advocate a dynamic or conditional CAPM in which beta is time-varying and depends on investors' information set at any given point in time.[18] Several recent studies estimate beta using a one-year window with daily returns (e.g., Lewellen and Nagel 2006; Cederburg and O'Doherty 2016; Herskovic, Kelly, Lustig, and Van Nieuwerburgh 2016; Hong and Sraer 2016). Following these studies, we estimate the following time-series regression for each firm-year.[19]

$$R_{it\tau} - R_{ft\tau} = \alpha_{i\tau} + \beta_{i\tau}\left(R_{mt\tau} - R_{ft\tau}\right) + \varepsilon_{it\tau} \tag{2}$$

$R_{it\tau}$ is firm *i*'s stock return on day *t* in year τ, $R_{ft\tau}$ is the risk-free rate on day *t* in year τ, and $R_{mt\tau}$ is the return of the market portfolio on day *t* in year τ. Our measure of systematic risk, β_{MKT}, is the slope coefficient on the excess return of the market portfolio. While systematic risk is the focus of our study, we also examine total risk and idiosyncratic risk. Total risk ($TVOL$) is the standard deviation of a firm's daily stock returns within its fiscal year, and idiosyncratic risk ($IVOL$) is the

[18] Liu, Stambaugh, and Yuan (2018) note that "[t]here are numerous approaches for estimating [time-varying] betas on individual stocks, and the literature does not really offer a consensus" (p. 3).

[19] Equation (2) allows a firm's risk exposures to change annually but assumes that a firm's risk exposures are stable within its fiscal year.

standard deviation of the residuals $\varepsilon_{it\tau}$. Following Bali, Engle, and Murray (2016), we require at least 200 daily observations in year τ to estimate our measures of risk.[20]

4.2 Descriptive Statistics

Table 2 reports descriptive statistics for our measures of risk as well as the corporate policy variables and measures of firm performance studied in Bertrand and Schoar (2003). All variables are defined in Appendix 1. We winsorize all continuous variables at the 1st and 99th percentiles to reduce the influence of outliers. The mean (median) β_{MKT} in our sample is 1.082 (1.021). Although our sample focuses on the S&P 1500, we still observe considerable variation in firms' systematic risk exposures. The standard deviation of β_{MKT} is 0.521, and the interquartile range of β_{MKT} is 0.644.

5 Methodology and Empirical Results

5.1 Methodology

To test whether managerial style is an important determinant of systematic risk, we adopt Bertrand and Schoar's (2003) identification strategy. First, we regress each measure of risk on firm fixed effects (γ_i) and year fixed effects (α_t). Firm fixed effects control for time-invariant firm characteristics. Year fixed effects control for cross-sectional changes in risk such as those documented by Campbell, Lettau, Malkiel, and Xu (2001). Then, we add manager fixed effects to our base model and examine whether the manager fixed effects have incremental explanatory power. Using the "to" positions in Table 1, we create three groups of manager fixed effects: λ_{CEO} are fixed effects for managers who are CEO in the last position we observe them in, λ_{CFO} are fixed effects for managers who are CFO in the last position we observe them in, and λ_{Other} are fixed

[20] To ensure that microstructure frictions such as bid-ask bounce do not confound our results, we repeat our analysis for each measure of risk using weekly returns in lieu of daily returns. We require at least 26 weekly observations in year τ to estimate our measures of risk. Our results are qualitatively similar when we use these measures of risk.

effects for managers who are neither CEO nor CFO in the last position we observe them in. The manager fixed effects are indicator variables that equal one if manager j works at firm i during fiscal year τ. For each measure of risk, we estimate three models:

$$Risk_{i\tau} = \alpha_\tau + \gamma_i + \varepsilon_{i\tau} \tag{3}$$

$$Risk_{i\tau} = \alpha_\tau + \gamma_i + \lambda_{CEO} + \varepsilon_{i\tau} \tag{4}$$

$$Risk_{i\tau} = \alpha_\tau + \gamma_i + \lambda_{CEO} + \lambda_{CFO} + \lambda_{Other} + \varepsilon_{i\tau} \tag{5}$$

Note that none of these models include time-varying firm characteristics (e.g., leverage). Suppose that differences between managers lead to differences in their firms' capital structure, which affects systematic risk. If we controlled for leverage, we would ignore this effect. The goal of our first test is to quantify the *total* effect of managers on systematic risk, so we exclude time-varying firm controls.[21] When we look at the mechanisms through which managers affect systematic risk, we include time-varying firm controls and examine the extent to which these controls explain manager fixed effects on systematic risk.

5.2 Baseline Result

5.2.1 Executive Fixed Effects on Systematic Risk

Table 3 reports the results from estimating equations (3), (4), and (5) using the sample of firm-years with non-missing data. For each measure of risk, the first row reports the adjusted R^2 of our base model that includes only firm fixed effects and year fixed effects. The second row reports adjusted R^2 when we include CEO fixed effects, and the third row reports adjusted R^2 when

[21] As Angrist and Pischke (2008) note, "Some variables are bad controls and should not be included in a regression model... Bad controls are variables that are themselves outcome variables" (p. 64).

we include fixed effects for all three groups of managers. The second and third rows also report F-statistics, which test the joint significance of the manager fixed effects.[22]

The adjusted R^2 of our base model is 42.94 percent for β_{MKT}. Adding CEO fixed effects to our base model increases adjusted R^2 to 45.60 percent, and adding manager fixed effects for all three groups of managers increases adjusted R^2 to 50.10 percent.[23] Overall, adjusted R^2 increases by 7.16 percentage points (50.10–42.94), which is equivalent to a 16.67 percent (7.16/42.94) increase relative to the base model. For comparison, adjusted R^2 increases by 4.43 percentage points (66.05–61.62) when we use $IVOL$ as the dependent variable, and adjusted R^2 increases by 4.56 percentage points (66.55–61.99) when we use $TVOL$ as the dependent variable. These increases in adjusted R^2 are equivalent to a 7.19 percent (4.43/61.62) and a 7.36 percent (4.56/61.99) increase relative to the base model for $IVOL$ and $TVOL$, respectively. In all specifications, the F-test strongly rejects the null hypothesis that the manager fixed effects are jointly equal to zero ($p < 0.0001$).[24]

The incremental adjusted R^2s reported in Table 3 are comparable in magnitude to those in prior studies. Bertrand and Schoar (2003) report large increases in adjusted R^2 for SG&A (37 percentage points), number of diversifying acquisitions (11 percentage points), and interest

[22] We use robust standard errors when we test the joint significance of the manager fixed effects. With clustered standard errors, the degree of freedom of our model is the minimum of the number of regressors and the number of clusters minus 1 (Cameron and Miller 2015). Since the number of clusters exceeds the number of regressors, the degree of freedom is the number of regressors. It is not possible to test the joint significance of the manager fixed effects using clustered standard errors because the number of linear restrictions exceeds the degree of freedom. It is, however, possible to consistently estimate the individual manager fixed effects using clustered standard errors, which we report in Figure 1.

[23] The evidence on non-CEO executive fixed effects is consistent with the view in the management literature that the entire TMT rather than the CEO alone determines organizational outcomes (Finkelstein 1992; Ke, Mao, Wang, and Zuo 2021).

[24] When a stock is infrequently traded, estimates of systematic risk using equation (2) may be biased. To alleviate this concern, we re-estimate equations (3), (4), and (5) using Dimson's (1979) beta. For details on this test, please refer to Section 1 of the Online Appendix. In Section 2 of the Online Appendix, we explore whether our results generalize to other empirical asset pricing models. We find that manager fixed effects have incremental explanatory power for every factor of the Fama-French Six-Factor Model, with the most pronounced results for the "CMA" investment factor.

coverage (10 percentage points). However, Bertrand and Schoar (2003) report small increases in adjusted R^2 for other variables such as investment to cash flow sensitivity (1 percentage point), leverage (2 percentage points), and cash holdings (3 percentage points). More recently, Dyreng, Hanlon, and Maydew (2010) examine manager fixed effects for tax avoidance. Their adjusted R^2 increases by 6.4 percentage points when manager fixed effects and year fixed effects are added to their base model, which includes only firm fixed effects. Ge, Matsumoto, and Zhang (2011) examine manager fixed effects for several financial reporting variables: discretionary accruals, off-balance sheet accounting, pension accounting, meeting and beating analysts' expectations, earnings smoothing, and the likelihood of misstatements. Their average incremental adjusted R^2 is 2 percentage points.

5.2.2 Frequency of Significant Executive Fixed Effects

The alternative hypothesis of the F-tests performed in Table 3 is that at least one of the manager fixed effects is not zero. Thus, a valid concern is that rejecting the null hypothesis does not necessarily mean that an economically significant number of manager fixed effects are different from zero.[25] To address this concern, Figure 1 reports the actual and expected number of significant manager fixed effects (t-statistics). Under the null hypothesis that managerial style is not a determinant of systematic risk, we would expect 16 (i.e., 1628×0.01) manager fixed effects to be significant at the 1 percent level, 81 (i.e., 1628×0.05) manager fixed effects to be significant at the 5 percent level, and 163 (i.e., 1628×0.10) manager fixed effects to be significant at the 10 percent level. When we use β_{MKT} as the dependent variable, 570 manager fixed effects are significant at the 1 percent level, 703 manager fixed effects are significant at the 5 percent level, and 802 manager fixed effects are significant at the 10 percent level. Overall, the number of

[25] Fee, Hadlock, and Pierce (2013) highlight this limitation of the F-test.

significant manager fixed effects is far greater than would be expected by chance. Moreover, our results suggest that manager fixed effects on systematic risk are pervasive and are not confined to a small subset of managers.

5.2.3 Economic Magnitude of Executive Fixed Effects

Next, we examine the economic magnitude of manager fixed effects on β_{MKT}. In Table 4, we report the distribution of manager fixed effects for each regression in Table 3. When we compute these statistics, we weight each manager fixed effect by the inverse of its standard error to account for estimation error. Our results suggest that manager fixed effects are economically large. Hiring an executive at the 25th percentile of the distribution is expected to reduce β_{MKT} by 0.201, while hiring an executive at the 75th percentile of the distribution is expected to increase β_{MKT} by 0.161.[26]

5.3 Stock Returns and Executive Fixed Effects on Systematic Risk

Our previous tests indicate that a large fraction of the variation in systematic risk can be explained by the presence of manager fixed effects. We next explore whether these manager fixed effects are associated with firms' stock returns. If beta-decreasing (beta-increasing) executives tend to invest in low (high) beta projects, then they should be associated with lower (higher) expected returns in equilibrium. To shed light on this question, we proceed as follows. First, we estimate manager fixed effects on stock returns by replacing the dependent variable in equation (5) with a firm's annual stock return during its fiscal year (RET). Second, we examine the association between manager fixed effects on RET and manager fixed effects on β_{MKT}.

The results of this test are reported in Table 5. Manager fixed effects on RET are positively related to manager fixed effects on β_{MKT}. The coefficient for manager fixed effects on β_{MKT} is

[26] When a new CEO is hired, the average unsigned change in β_{MKT} is 0.374 (untabulated).

statistically significant at the 1 percent level and economically large. The interquartile range for manager fixed effects on β_{MKT} is 0.362 (Table 4), so we would expect the effect of a manager on her firm's annual stock returns to be 5 percentage points higher (i.e., 0.362×0.138) for a manager at the 75th percentile of the β_{MKT} distribution relative to a manager at the 25th percentile of the β_{MKT} distribution. Manager fixed effects on RET are not significantly associated with manager fixed effects on $IVOL$.

5.4 Mechanisms

In this section, we perform four tests to explore the mechanisms that explain manager fixed effects on systematic risk.

5.4.1 Executive Fixed Effects on Corporate Policies

In our first test, we examine whether manager fixed effects on corporate policy variables explain manager fixed effects on systematic risk. To shed light on this mechanism, we examine the relation between manager fixed effects on systematic risk and the manager fixed effects studied in Bertrand and Schoar (2003). Bertrand and Schoar (2003) document significant manager fixed effects for twelve corporate policy variables. These variables are related to investment policy (capital expenditures, investment to Q sensitivity, investment to cash flow sensitivity, and number of acquisitions), financial policy (leverage, interest coverage, cash holdings, and dividend payout), and organizational strategy (number of diversifying acquisitions, R&D expenditures, advertising expenditures, and SG&A expenditures).[27]

[27] All variables are defined in Appendix 1. To reduce skewness, we use the natural logarithm of one plus the raw value for number of acquisitions, number of diversifying acquisitions, and interest coverage. Table 4 reports the distribution of manager fixed effects for each corporate policy variable. When we compute these statistics, we weight each manager fixed effect by the inverse of its standard error to account for estimation error. For brevity, we do not report the estimation of these manager fixed effects. Please refer to Bertrand and Schoar (2003) for details on each specific regression.

Due to multicollinearity, we do not simply regress manager fixed effects on beta on the twelve manager fixed effects studied in Bertrand and Schoar (2003). Instead, we proceed in two steps. In the first step, we examine whether latent factors (i.e., unobservable management styles) explain the covariance structure among the corporate policy fixed effects. In the second step, we examine whether the factors thereof explain manager fixed effects on beta.

To prepare our data for factor analysis, we follow the convention of standardizing our variables to have zero mean and unit variance. Using a Scree test (Cattell 1966), we determine that there are three factors. Panel A of Table 6 reports the factor loadings of the three factors, Panel B of Table 6 reports the eigenvalues and the proportion of variation explained by the three factors, and Panel C of Table 6 examines the relation between the three factors and manager fixed effects on beta.

The three factors identified in Table 6 have natural interpretations. The first factor loads positively on number of acquisitions and number of diversifying acquisitions. We interpret this factor as a preference for external growth. The second factor loads positively (negatively) on interest coverage (leverage). We interpret this factor as a preference for financial conservatism. The third factor loads positively on investment (i.e., capital expenditures), cash holdings, and R&D. We interpret this factor as a preference for internal growth.

In Panel C of Table 6, we examine the relation between the three factors and manager fixed effects on beta. To ensure that these relations are not driven by managerial ability on performance, we control for manager fixed effects on ROA.[28] Factor 3 (internal growth) is positively related to manager fixed effects on β_{MKT}. The coefficient on Factor 3 is statistically significant at the 1 percent level and economically large. The interquartile range for Factor 3 is 0.569 (untabulated),

[28] Our inferences are unchanged when we use manager fixed effects on operating ROA to measure performance effects instead.

so we would expect the effect of a manager on β_{MKT} to be 0.147 larger (i.e., 0.569×0.259) for a manager at the 75th percentile of the Factor 3 distribution relative to a manager at the 25th percentile of the Factor 3 distribution, holding the other covariates constant. On the other hand, there is some evidence that Factor 2 (financial conservatism) is negatively related to manager fixed effects on β_{MKT}. The coefficient on Factor 2 is statistically significant at the 10 percent level and economically large. The interquartile range for Factor 2 is 0.895 (untabulated), so we would expect the effect of a manager on β_{MKT} to be 0.062 smaller (i.e., 0.895×0.069) for a manager at the 75th percentile of the Factor 2 distribution relative to a manager at the 25th percentile of the Factor 2 distribution, holding the other covariates constant. Factor 1 (external growth) is not significantly related to manager fixed effects on β_{MKT}.[29]

Manager fixed effects on ROA are not significantly related to manager fixed effects on β_{MKT}. However, manager fixed effects on ROA are negatively related to manager fixed effects on idiosyncratic risk. The coefficient on the performance effect is negative and significant at the 1 percent level for $IVOL$. Managers who have larger performance fixed effects are associated with lower idiosyncratic risk, which suggests that these managers have superior ability, not greater risk tolerance.[30]

Overall, Table 6 provides evidence that manager fixed effects on corporate policy variables partially explain manager fixed effects on systematic risk. Specifically, manager fixed effects on systematic risk are positively related to managers' preferences for internal growth and negatively related to managers' preferences for financial conservatism.

[29] We observe a similar pattern of results if we directly regress manager fixed effects on beta on the corporate policy fixed effects.

[30] The Pearson product-moment correlation (Spearman rank-order correlation) between manager fixed effects on β_{MKT} and manager fixed effects on $IVOL$ is 0.438 (0.450).

5.4.2 Event-Time Analysis of Systematic Risk and Corporate Policies

Next, we perform a set of dynamic tests that plot changes in beta and corporate policies in event-time surrounding executive transitions. We begin by classifying managers into three groups based on the sign and the significance of the manager fixed effects estimated in Table 3: *Beta-Increasing Managers* are managers with positive fixed effects that are significant at the 5 percent level, *Beta-Decreasing Managers* are managers with negative fixed effects that are significant at the 5 percent level, and *Beta-Neutral Managers* are managers with fixed effects that are not significant at the 5 percent level (either positive or negative). If a firm employs one of these managers, we collect β_{MKT} for the period [–2, +2], where 0 denotes the hiring year. Then, we subtract the average value of β_{MKT} measured over the interval [-2, -1] from the raw value of β_{MKT} for each firm-year. Figure 2 plots these values for the full interval [–2, +2]. Thus, the value of beta over the interval [0, 2] represents the change in beta from the firm's average beta before the executive joined the firm. The evidence in Figure 2 suggests that beta-increasing (beta-decreasing) managers lead to an immediate and persistent increase (decrease) in β_{MKT}.[31]

We perform a similar analysis in Figure 3, plotting the evolution of capital expenditures (*CAPEX*) in event-time surrounding executive transitions. The evidence in Figure 3 suggests that beta-increasing managers lead to an immediate and persistent increase in capital expenditures relative to beta-decreasing and beta-neutral managers. This finding is consistent with our previous test, which found that managers' preferences for internal growth partially explain manager fixed effects on beta. We do not observe a clear pattern of results for asset sales, R&D, and acquisitions (see Section 3 of the Online Appendix for details).

[31] In Section 3 of the Online Appendix, we find that the effect of beta-increasing managers is more pronounced when the hiring firm underperformed its industry peers in the year before the executive transition, and we find that the effect of beta-decreasing managers is more pronounced when the hiring firm does not have an independent board. Please note that these are univariate analyses, so caution should be taken in interpreting these figures.

5.4.3 Firm-Level Determinants of Beta

In our third test, we estimate manager fixed effects after controlling for known firm-level determinants of beta. As discussed in Section 2, beta is related to firm size, book-to-market, and leverage. We adopt the standard definitions used in the prior literature (Cosemans et al. 2015). Size is the market value of equity. Book-to-market is book value of equity divided by market value of equity, where book value of equity equals common equity plus deferred taxes and investment tax credits minus the book value of preferred stock. Lastly, leverage is book value of assets divided by the market value of equity. We use the logarithmic transformation of these variables.

Without controlling for time-varying firm characteristics (Table 3), we find that adjusted R^2 increases by 7.16 percentage points when we add manager fixed effects to the model with β_{MKT} as the dependent variable. After controlling for time-varying firm characteristics (Table 7), we find that adjusted R^2 increases by 6.86 percentage points (51.51−44.65). This test indicates that manager fixed effects are incremental to known firm-level determinants of beta.

5.4.4 Executive Fixed Effects on Unlevered Beta

In our fourth test, we estimate manager fixed effects on unlevered beta (i.e., asset beta). Unlevered beta removes the effect of the firm's capital structure and isolates the component of systematic risk due to the firm's assets, such as the different types of businesses in which the firm operates and the firm's operating leverage.

Following prior research (e.g., Choy, Lin, and Officer 2014), we estimate unlevered beta using Hamada's (1972) equation:

$$\beta^{U}_{MKT} = \frac{\beta_{MKT}}{1 + (1 - T_c)\left(\frac{D}{E}\right)} \tag{6}$$

β_{MKT}^{U} denotes unlevered beta (or asset beta), β_{MKT} denotes levered beta (or equity beta), T_c denotes the corporate tax rate, D denotes the market value of debt, and E denotes the market value of equity. We use equation (2) to estimate levered beta. Following the standard convention, we use book value of debt as a proxy for market value of debt, and we measure book value of debt and market value of equity at the beginning of the year during which levered beta is estimated. Lastly, we use the GAAP effective tax rate defined as total income tax expense divided by pre-tax book income before special items.[32]

The results of this test are reported in Table 8. The adjusted R^2 of our base model is 43.35 percent. Adding CEO fixed effects to our base model increases adjusted R^2 to 45.35 percent, and adding fixed effects for all three groups of managers (CEO, CFO, and Other) increases adjusted R^2 to 49.41 percent. Adjusted R^2 increases by 6.06 percentage points (49.41–43.35), which is equivalent to a 13.98 percent (6.06/43.35) increase relative to the base model. Overall, our results indicate that manager fixed effects are an important determinant of unlevered beta, suggesting that managers influence the risk of their firm's underlying assets. Another implication of this test is that removing the effect of leverage attenuates the explanatory power of manager fixed effects for beta (7.16 percentage points for levered beta versus 6.06 percentage points for unlevered beta). This finding suggests that managers also influence systematic risk through leverage.

5.5 Executive Characteristics

In Table 9, we examine whether manager fixed effects on systematic risk are related to observable manager characteristics. More specifically, we examine the economic conditions at the beginning of a manager's career; we also examine the manager's birth year and gender.[33]

---

[32] Our results are robust to using simulated marginal tax rates (Graham 1996a, 1996b) and the cash effective tax rate defined as cash tax paid divided by pre-tax book income before special items.

[33] Three notable events occurred during our sample period: the dotcom bubble, the Enron scandal, and the global financial crisis. Our identification strategy examines whether systematic risk is correlated across at least two firms

Following Schoar and Zuo (2017), we define *Recession* as an indicator variable that equals 1 if there is a recession in the calendar year when a manager turns 24 years old. We use the manager's birth year plus 24 as the beginning of the manager's career to avoid endogenous selection of when an individual chooses to enter the labor market. Recession years are based on the business cycle dating database of the National Bureau of Economic Research (NBER). Recession years include the trough of the business cycle and all years leading to the trough (excluding the peak of the business cycle).

Panel A of Table 9 presents descriptive statistics for the sample of managers for whom we were able to estimate manager fixed effects. The descriptive statistics are virtually identical for the Execucomp universe (untabulated). Not surprisingly, the majority of the executives in our sample are male (93.7 percent). 23.7 percent of the executives in our sample entered the labor market during a recession. The mean birth year in our sample is 1953.

In Panel B of Table 9, we find that manager fixed effects on β_{MKT} are related to managers' early-career experiences. The coefficient on *Recession* is statistically significant at the 5 percent level and economically large. On average, we would expect the signed effect of a manager on β_{MKT} to be 0.240 smaller if the manager entered the labor market during a recession, holding the other covariates constant. Age and gender, however, are not related to manager fixed effects on β_{MKT}. These results are surprising given that older cohorts are more risk-averse than younger cohorts and women are more risk-averse than men (e.g., Byrnes, Miller, and Schafer 1999). However, as Hambrick and Mason (1984) note, it may take "a certain kind of person to rise to the top ranks of a firm" (p. 204). Therefore, individuals who rise to the top ranks of a firm may share

when the same manager is present. If the events thereof induce executive transitions and affect firms' risk exposures, then these events could drive our results and our results may not generalize. This is not the case. Our results are qualitatively similar if we exclude managers who join or leave a firm in 2000 (the dotcom bubble), 2001 (the Enron scandal), or 2007-2008 (the global financial crisis).

many similarities (e.g., risk aversion), despite differences in age or gender. It should be noted, however, that the tests in Table 9 have low power. The dependent variables are regression coefficients, which are noisy by definition. Moreover, demographic characteristics are "incomplete and imprecise proxies of executives' cognitive frames" (Hambrick 2007, p. 335).

5.6 Executive Discretion

Next, we examine whether certain environments amplify the effects of managerial style on systematic risk. This test is inspired by Finkelstein, Hambrick, and Cannella's (2009) influential book *Strategic Leadership*. They conclude that "considerable work is needed in understanding the determinants of [executive] discretion," and they call for "examination of how organizational and individual characteristics affect the top executive's latitude of action" (p. 41).

In Table 10, we examine whether *unsigned* manager fixed effects on systematic risk vary with firm size (*Size*), profitability (*Return on Assets*), leverage (*Leverage*), growth opportunities (*Tobin's Q*), ownership structure (*Institutional Holdings*), the firm's information environment (*Percentage Bid-Ask Spread* and *Analyst Coverage*), whether the firm uses relative performance evaluation grants (*RPE*),[34] whether the firm underperformed its industry peers (*Underperform*), the value-weighted return to the market portfolio (*Value-Weighted Market Return*), whether independent directors comprise the majority of the board (*Independent Board*), and whether the manager is a member of the firm's board of directors (*Board Member*). All variables are defined in Appendix 1. To ensure that *Independent Board* and *Board Member* capture the extent to which the board monitors the manager's actions, we measure these variables in the year that the executive joins her firm. We lag the other explanatory variables by one year because these variables may be

[34] Prior research shows that RPE contracts can significantly alter CEOs' risk-taking incentives (Park and Vrettos 2015; Do, Zhang, and Zuo 2022). This line of work focuses on a CEO's time-varying incentives, whereas we examine a CEO's time-invariant fixed effects.

directly affected by managers' actions (e.g., *Leverage* and *Return on Assets*). By measuring these variables in the year before the executive joins her firm, we hope to alleviate some concerns about reverse causality. Nevertheless, we acknowledge that the results in this table are exploratory and do not establish causality.

Unsigned manager fixed effects on β_{MKT} are significantly related to three variables in Table 10: *Size*, *Return on Assets*, and *Independent Board*. The coefficient on *Size* is statistically significant at the 1 percent level and economically large. The interquartile range for *Size* in our sample is 2.239 (untabulated). Therefore, we would expect the unsigned effect of a manager on β_{MKT} to be 0.116 smaller (i.e., 2.239×0.052) if the manager leads a firm at the 75th percentile of the *Size* distribution relative to a firm at the 25th percentile of the *Size* distribution, holding the other covariates constant. Given that Execucomp tracks managers in the S&P 1500 and our sample selection procedure further requires that a manager work at two or more Execucomp firms, the results documented hitherto likely represent a lower bound on the effects of managerial style on systematic risk. Turning to profitability, we find that the coefficient on *Return on Assets* is statistically significant at the 5 percent level and economically large. The interquartile range for *Return on Assets* in our sample is 0.122 (untabulated). Therefore, we would expect the unsigned effect of a manager on β_{MKT} to be 0.065 smaller (i.e., 0.122×0.536) if the manager leads a firm at the 75th percentile of the *Return on Assets* distribution relative to a firm at the 25th percentile of the *Return on Assets* distribution, holding the other covariates constant. This finding suggests that when a company is performing well (poorly), an incoming manager is granted less (more) discretion to implement her strategic vision. Lastly, the coefficient on *Independent Board* is statistically significant at the 1 percent level and economically large. The coefficient on *Independent Board* indicates that on average, the unsigned effect of a manager on β_{MKT} is 0.210

smaller when a manager works at a firm with an independent board relative to a firm with a non-independent board. This finding is consistent with the notion that independent boards are associated with more intense monitoring of managers (e.g., Nguyen and Nielsen 2010; Guo and Masulis 2015; Fahlenbrach, Low, and Stulz 2017; Masulis and Zhang 2019). Our evidence suggests that this heightened scrutiny constrains managers' person-specific styles.[35]

5.7 Hiring Preferences

In Table 11, we ask whether certain firm and market characteristics lead to a preference for managers who have beta-increasing styles, and whether other firm and market characteristics lead to a preference for managers who have beta-decreasing styles. For example, if the market performed well in the previous year, do boards prefer beta-increasing managers? To this end, we examine whether *signed* manager fixed effects on systematic risk vary with firm size (*Size*), profitability (*Return on Assets*), leverage (*Leverage*), growth opportunities (*Tobin's Q*), ownership structure (*Institutional Holdings*), the firm's information environment (*Percentage Bid-Ask Spread* and *Analyst Coverage*), whether the firm uses relative performance evaluation grants (*RPE*), whether the firm underperformed its industry peers (*Underperform*), the value-weighted return to the market portfolio (*Value-Weighted Market Return*), whether independent directors comprise the majority of the board (*Independent Board*), and whether the manager is a member of the firm's board of directors (*Board Member*). Overall, we do not observe a clear pattern of results in Table 11. While we do not find evidence of matching based on observable characteristics, our results do

[35] In untabulated analysis, we also find that unsigned manager fixed effects on beta are larger in firms with high beta volatility. In particular, we perform two comparisons. First, we compare managers who worked at a high beta volatility firm with managers who never worked at a high beta volatility firm. Second, we compare managers that always worked at a high beta volatility firm with managers that did not always work at a high beta volatility firm. In both comparisons, unsigned manager fixed effects on beta are larger for the former group.

not preclude the possibility that managers may be matched to firms based on unobservable characteristics.

6 Conclusion

The objective of our paper is to show that manager-specific differences are important for understanding firm exposures to systematic risk. Tracking managers across different firms over time, we find that manager fixed effects explain a significant amount of variation in firms' exposures to systematic risk. The impact of managerial styles on firm betas is a pervasive phenomenon and is not confined to a small subset of managers. In addition, we find that manager fixed effects on systematic risk are positively related with manager fixed effects on stock returns. In other words, managers who have beta-decreasing (beta-increasing) styles are associated with lower (higher) stock returns. We also show that manager fixed effects on corporate policy variables are one channel that partially explains manager fixed effects on systematic risk. Specifically, manager fixed effects on systematic risk are positively related to managers' preferences for internal growth and negatively related to managers' preferences for financial conservatism. Importantly, manager fixed effects are incremental to known determinants of systematic risk. We can also tie manager fixed effects on systematic risk to observable manager traits such as personal experiences. We find that managers who enter the labor market during recessions exhibit a strong proclivity to reduce their firm's systematic risk. Finally, we show that these effects are more pronounced when managers wield more influence, as in smaller firms and firms that do not have an independent board.

A limitation of the managerial style literature in general is that absent exogenous variation in executive transitions, we cannot disentangle whether (1) managers impose their styles on the firms that they lead or (2) boards hire managers who match their firm's strategic needs. For example, Finkelstein, Hambrick, and Cannella's (2009) fit-drift/shift-refit model expands on the second interpretation. They argue that the economic environment can gradually *drift* or radically *shift*, creating a mismatch between the incumbent CEO's style and the firm's strategic needs. CEO succession provides an opportunity for the board to realign the firm's leadership with its prevailing economic environment (Jenter and Lewellen 2021). Our results suggest that managerial style is relevant to a firm's exposure to systematic risk, regardless of whether managers impose their styles against the will of the board or whether boards actively seek managers with particular styles. More research along these lines could further our understanding of the implications of corporate managers for their firms' risk exposures.

References

Abowd, J. M., Kramarz, F., Margolis, D. N., 1999. High wage workers and high wage firms. *Econometrica* 67 (2), 251–333.

Angrist, J. D., Pischke, J. S., 2008. *Mostly Harmless Econometrics: An Empiricist's Companion*. Princeton University Press, Princeton, NJ.

Armstrong, C. S., Vashishtha, R., 2012. Executive stock options, differential risk-taking incentives, and firm value. *Journal of Financial Economics* 104 (1), 70–88.

Bali, T. G., Engle, R. F., Murray, S., 2016. *Empirical Asset Pricing: The Cross Section of Stock Returns*. John Wiley & Sons, Hoboken, NJ.

Bamber, L. S., Jiang, J., Wang, I. Y., 2010. What's my style? The influence of top managers on voluntary corporate financial disclosure. *The Accounting Review* 85 (4), 1131–1162.

Beaver, W., Kettler, P., Scholes, M., 1970. The association between market determined and accounting determined risk measures. *The Accounting Review* 45 (4), 654–682.

Ben-Zion, U., Shalit, S. S., 1975. Size, leverage, and dividend record as determinants of equity risk. *Journal of Finance* 30 (4), 1015–1026.

Benmelech, E., Frydman, C., 2015. Military CEOs. *Journal of Financial Economics* 117 (1), 43–59.

Bennedsen, M., Pérez-González, F., Wolfenzon, D., 2020. Do CEOs matter? Evidence from hospitalization events. *Journal of Finance* 75 (4), 1877–1911.

Berk, J. B., Green, R. C., Naik, V., 1999. Optimal investment, growth options, and security returns. *Journal of Finance* 54 (5), 1553–1607.

Berk, J. B., van Binsbergen, J. H., 2016. Assessing asset pricing models using revealed preferences. *Journal of Financial Economics* 119 (1), 1–23.

Bernile, G., Bhagwat, V., Rau, P. R., 2016. What doesn't kill you will only make you more risk-loving: Early-life disasters and CEO behavior. *Journal of Finance* 72 (1), 167–206.

Bertrand, M., Mullainathan, S., 2001. Are CEOs rewarded for luck? The ones without principals are. *Quarterly Journal of Economics* 116 (3), 901–932.

Bertrand, M., Schoar, A., 2003. Managing with style: The effect of managers on firm policies. *Quarterly Journal of Economics* 118 (4), 1169–1208.

Bollerslev, T., Engle, R. F., Wooldridge, J. M., 1988. A capital asset pricing model with time-varying covariances. *Journal of Political Economy* 96 (1), 116–131.

Breen, W. J., Lerner, E. M., 1973. Corporate financial strategies and market measures of risk and return. *Journal of Finance* 28 (2), 339–351.

Byrnes, J. P., Miller, D. C., Schafer, W. D., 1999. Gender differences in risk taking: A meta-analysis. *Psychological Bulletin* 125 (3), 367–383.

Cameron, A. C., Miller, D. L., 2015. A practitioner's guide to cluster-robust inferences. *Journal of Human Resources* 50 (2), 317–372.

Campbell, J. Y., Lettau, M., Malkiel, B. G., Xu, Y., 2001. Have individual stocks become more volatile? An empirical exploration of idiosyncratic risk. *Journal of Finance* 56 (1), 1–43.

Carlson, M., Fisher, A., Giammarino, R., 2004. Corporate investment and asset price dynamics: Implications for the cross-section of returns. *Journal of Finance* 59 (6), 2577–2603.

Cattell, R. B., 1966. The scree test for the number of factors. *Multivariate Behavioral Research* 1 (2), 245–276.

Cederburg, S., O'Doherty, M. S., 2016. Does it pay to bet against beta? On the conditional performance of the beta anomaly. *Journal of Finance* 71 (2), 737–774.

Chen, X., Cheng, Q., Wang, X., 2015. Does increased board independence reduce earnings management? Evidence from recent regulatory reforms. *Review of Accounting Studies* 20 (2), 899–933.

Choy, H., Lin, J., Officer, M. S., 2014. Does freezing a defined benefit pension plan affect firm risk? *Journal of Accounting and Economics* 57 (1), 1–21.

Coles, J. L., Daniel, N. D., Naveen, L., 2006. Managerial incentives and risk-taking. *Journal of Financial Economics* 79 (2), 431–468.

Cosemans, M., Frehen, R., Schotman, P. C., Bauer, R., 2015. Estimating security betas using prior information based on firm fundamentals. *Review of Financial Studies* 29 (4), 1072–1112.

Cronqvist, H., Yu, F., 2017. Shaped by their daughters: Executives, female socialization, and corporate social responsibility. *Journal of Financial Economics* 126 (3), 543–562.

Custódio, C., Metzger, D., 2013. How do CEOs matter? The effect of industry expertise on acquisition returns. *Review of Financial Studies* 26 (8), 2008–2047.

Custódio, C., Metzger, D., 2014. Financial expert CEOs: CEO's work experience and firm's financial policies. *Journal of Financial Economics* 114 (1), 125–154.

Das, S., Kuhnen, C. M., Nagel, S., 2020. Socioeconomic status and macroeconomic expectations. *Review of Financial Studies* 33 (1), 395–432.

Dessaint, O., Olivier, J., Otto, C. A., Thesmar, D., 2021. CAPM-based company (mis) valuations. *Review of Financial Studies* 34 (1), 1–66.

Dimson, E., 1979. Risk measurement when shares are subject to infrequent trading. *Journal of Financial Economics* 7 (2), 197–226.

Dittmar, A., Duchin, R., 2016. Looking in the rearview mirror: The effect of managers' professional experience on corporate financial policy. *Review of Financial Studies* 29 (3), 565–602.

Do, T., Zhang, H., Zuo, L., 2022. Rocking the boat: How relative performance evaluation affects corporate risk taking. *Journal of Accounting and Economics* 73 (1), 101425.

Dyreng, S. D., Hanlon, M., Maydew, E. L., 2010. The effects of executives on corporate tax avoidance. *The Accounting Review* 85 (4), 1163–1189.

Fahlenbrach, R., Low, A., Stulz, R. M., 2017. Do independent director departures predict future bad events? *Review of Financial Studies* 30 (7), 2313–2358.

Fan, J. P. H., Wong, T. J., Zhang, T., 2007. Politically connected CEOs, corporate governance, and post-IPO performance of China's newly partially privatized firms. *Journal of Financial Economics* 84 (2), 330–357.

Fee, C. E., Hadlock, C. J., Pierce, J. R., 2013. Managers with and without style: Evidence using exogenous variation. *Review of Financial Studies* 26 (3), 567–601.

Finkelstein, S., 1992. Power in top management teams: Dimensions, measurement, and validation. *Academy of Management Journal* 35 (3), 505–538.

Finkelstein, S., Hambrick, D. C., Cannella, A. A., 2009. *Strategic Leadership: Theory and Research on Executives, Top Management Teams, and Boards*. Oxford University Press, New York, NY.

Fisher, L., 1974. The economic determinants of systematic risk: Discussion. *Journal of Finance* 29 (2), 488–492.

Garfinkel, J. A., 2009. Measuring investors' opinion divergence. *Journal of Accounting Research* 47 (5), 1317–1348.

Gayle, G. L., Golan, L., Miller, R. A., 2015. Promotion, turnover, and compensation in the executive labor market. *Econometrica* 83(6), 2293–2369.

Ge, W., Matsumoto, D., Zhang, J. L., 2011. Do CFOs have style? An empirical investigation of the effect of individual CFOs on accounting practices. *Contemporary Accounting Research* 28 (4), 1141–1179.

Gomes, J., Kogan, L., Zhang, L., 2003. Equilibrium cross section of returns. *Journal of Political Economy* 111 (4), 693–732.

Gopalan, R., Milbourn, T., Song, F., 2010. Strategic flexibility and the optimality of pay for sector performance. *Review of Financial Studies* 23 (5), 2060–2098.

Gormley, T. A., Matsa, D. A., Milbourn, T., 2013. CEO compensation and corporate risk: Evidence from a natural experiment. *Journal of Accounting and Economics* 56 (2–3), 79–101.

Graham, J. R., 1996a. Debt and the marginal tax rate. *Journal of Financial Economics* 41 (1), 41–73.

Graham, J. R., 1996b. Proxies for the corporate marginal tax rate. *Journal of Financial Economics* 42 (2), 187–221.

Graham, J. R., Harvey, C. R., 2001. The theory and practice of corporate finance: Evidence from the field. *Journal of Financial Economics* 60 (2–3), 187–243.

Graham, J. R., Harvey, C. R., Puri, M., 2013. Managerial attitudes and corporate actions. *Journal of Financial Economics* 109 (1), 103–121.

Graham, J. R., Li, S., Qiu, J., 2012. Managerial attributes and executive compensation. *Review of Financial Studies* 25 (1), 144–186.

Greene, J., Smart, S., 1999. Liquidity provision and noise trading: Evidence from the "investment dartboard" column. *Journal of Finance* 54 (5), 1885–1899.

Guo, L., Masulis, R. W., 2015. Board structure and monitoring: New evidence from CEO turnovers. *Review of Financial Studies* 28 (10), 2770–2811.

Hall, B. J., Murphy, K. J., 2003. The trouble with stock options. *Journal of Economic Perspectives* 17 (3), 49–70.

Hamada, R. S., 1972. The effect of the firm's capital structure on the systematic risk of common stocks. *Journal of Finance* 27 (2), 435–452.

Hambrick, D. C., 2007. Upper echelons theory: An update. *Academy of Management Review* 32 (2), 334–343.

Hambrick, D. C., Mason, P. A., 1984. Upper echelons: The organization as a reflection of its top managers. *Academy of Management Review* 9 (2), 193–206.

Hanlon, M., Yeung, K., Zuo, L., 2022. Behavioral economics of accounting: A review of archival research on individual decision makers. *Contemporary Accounting Research* 39 (2), 1150–1214.

Harvey, C. R., 1989. Time-varying conditional covariances in tests of asset pricing models. *Journal of Financial Economics* 24 (2), 289–317.

Hayes, R. M., Lemmon, M., Qiu, M., 2012. Stock options and managerial incentives for risk taking: Evidence from FAS 123R. *Journal of Financial Economics* 105 (1), 174–190.

Herskovic, B., Kelly, B., Lustig, H., Van Nieuwerburgh S., 2016. The common factor in idiosyncratic volatility: Quantitative asset pricing implications. *Journal of Financial Economics* 119 (2), 249–283.

Hirshleifer, D., Low, A., Teoh, S. H., 2012. Are overconfident CEOs better innovators? *Journal of Finance* 67 (4), 1457–1498.

Hong, H., Sraer, D. A., 2016. Speculative betas. *Journal of Finance* 71 (5), 2095–2144.

Jagannathan, R., Wang, Z., 1996. The conditional CAPM and the cross-section of expected returns. *Journal of Finance* 51 (1), 3–53.

Jenter, D., Kanaan, F., 2015. CEO turnover and relative performance evaluation. *Journal of Finance* 70 (5), 2155–2184.

Jenter, D., Lewellen, K., 2021. Performance-induced CEO turnover. *Review of Financial Studies* 34 (2), 569–617.

Jiang, J. X., Petroni, K. R., Wang, I. Y., 2010. CFOs and CEOs: Who have the most influence on earnings management? *Journal of Financial Economics* 96 (3), 513–526.

Kaplan, S. N., Klebanov, M. M., Sorensen, M., 2012. Which CEO characteristics and abilities matter? *Journal of Finance* 67 (3), 973–1007.

Kaplan, S. N., Minton, B. A., 2012. How has CEO turnover changed? *International Review of Finance* 12 (1), 57–87.

Kaplan, S. N., Sorensen, M., 2021. Are CEOs different? *Journal of Finance* 76 (4), 1773–1811.

Karolyi, G. A., 1992. Predicting risk: Some new generalizations. *Management Science* 38 (1), 57–74.

Ke, B., Mao, X., Wang, B., Zuo, L., 2021. Top management team power in China: Measurement and validation. *Management Science* 67 (10), 6602–6627.

Kubick, T. R., Robinson, J. R., Starks, L. T., 2018. CEO incentives for risk-taking and compensation duration. Working Paper.

Kuhnen, C. M., Miu, A. C., 2017. Socioeconomic status and learning from financial information. *Journal of Financial Economics* 124 (2), 349–372.

Lev, B., Kunitzky, S., 1974. On the association between smoothing measures and the risk of common stocks. *The Accounting Review* 49 (2), 259–270.

Lewellen, J., Nagel, S., 2006. The conditional CAPM does not explain asset-pricing anomalies. *Journal of Financial Economics* 82 (2), 289–314.

Lewellen, K., 2006. Financing decisions when managers are risk averse. *Journal of Financial Economics* 82 (3), 551–589.

Lintner, J., 1965. The valuation of risk assets and the selection of risky investments in stock portfolios and capital budgets. *Review of Economics and Statistics* 47 (1), 13–37.

Liu, J., Stambaugh, R. F., Yuan, Y., 2016. Absolving beta of volatility's effects. *Journal of Financial Economics* 128 (1), 1–15.

Livdan, D., Sapriza, H., Zhang, L., 2009. Financially constrained stock returns. *Journal of Finance* 64 (4), 1827–1862.

Malmendier, U., 2018. Behavioral corporate finance. In: Bernheim, D., S. DellaVigna, and D. Laibson (Eds.). *Handbook of Behavioral Economics*, Vol. 1. Amsterdam: Elsevier.

Malmendier, U., Tate, G., 2005. CEO overconfidence and corporate investment. *Journal of Finance* 6 (6), 2661–2700.

Malmendier, U., Tate, G., 2008. Who makes acquisitions? CEO overconfidence and the market's reaction. *Journal of Financial Economics* 89 (1), 20–43.

Malmendier, U., Tate, G., Yan, J., 2011. Overconfidence and early-life experiences: The effect of managerial traits on corporate financial policies. *Journal of Finance* 65 (5), 1687–1733.

Markowitz, H., 1959. *Portfolio Selection: Efficient Diversification of Investments*. Wiley, New York, NY.

Masulis, R. W., Zhang, E. J., 2019. How valuable are independent directors? Evidence from external distractions. *Journal of Financial Economics* 132 (3), 226–256.

Melicher, R. W., 1974. Financial factors which influence beta variations within a homogenous industry environment. *Journal of Financial and Quantitative Analysis* 9 (2), 231–241.

Nguyen, B. D., Nielsen, K. M., 2010. The value of independent directors: Evidence from sudden deaths. *Journal of Financial Economics* 98 (3), 550–567.

Pan, Y., Wang, T. Y., Weisbach, M. S., 2015. Learning about CEO ability and stock return volatility. *Review of Financial Studies* 28 (6), 1623–1666.

Park, H., Vrettos, D., 2015. The moderating effect of relative performance evaluation on the risk incentive properties of executives' equity portfolios. *Journal of Accounting Research* 53 (5), 1055–1108.

Robichek, A. A., Cohn, R. A., 1974. The economic determinants of systematic risk. *Journal of Finance* 29 (2), 439–447.

Rosenberg, B., McKibben, W., 1973. The prediction of systematic and specific risk in common stocks. *Journal of Financial and Quantitative Analysis* 8 (2), 317–333.

Roussanov, N., Savor, P., 2014. Marriage and managers' attitudes to risk. *Management Science* 60 (10), 2496–2508.

Schoar, A., Zuo, L., 2016. Does the market value CEO styles? *American Economic Review* 106 (5), 262–266.

Schoar, A., Zuo, L., 2017. Shaped by booms and busts: How the economy impacts CEO career and management styles. *Review of Financial Studies* 30 (5), 1425–1456.

Sharpe, W. F., 1964. Capital asset prices: A theory of market equilibrium under conditions of risk. *Journal of Finance* 19 (3), 425–442.

Shivdasani, A., Yermack, D., 1999. CEO involvement in the selection of new board members: An empirical analysis. *Journal of Finance* 54 (5), 1829–1853.

Shue, K., Townsend, R. R., 2017. How do quasi-random option grants affect CEO risk-taking? *Journal of Finance* 72 (6), 2551–2588.

Thaler, R. H., 2000. From Homo economicus to Homo sapiens. *Journal of Economic Perspectives* 14 (1), 133–141.

APPENDIX 1

VARIABLE DEFINITIONS

Variable Name	Source	Description
$TVOL$	CRSP	Standard deviation of firm *i*'s daily stock returns during fiscal year τ.
β_{MKT} $IVOL$	CRSP, Fama-French factor data	For every firm *i*'s fiscal year τ, we estimate the following OLS regression using daily stock returns (*t* indexes days in year τ): $$R_{it\tau} - R_{ft\tau} = \alpha_{i\tau} + \beta_{i\tau}\left(R_{mt\tau} - R_{ft\tau}\right) + \varepsilon_{it\tau}$$ β_{MKT} is the slope coefficient on the excess return to the market ($\beta_{i\tau}$). $IVOL$ is the standard deviation of the residuals $\varepsilon_{it\tau}$.
RET	CRSP	Firm *i*'s annual stock return for fiscal year τ.
Investment	Compustat	Capital expenditures (*CAPX*) divided by net property, plant, and equipment at the beginning of the fiscal year (*PPENT*).
Tobin's *Q*	Compustat	Market value of assets divided by book value of assets (*AT*). Market value of assets equals book value of assets (*AT*) plus the market value of common equity (|*PCC_F*|×*CSHO*) less the sum of the book value of common equity and deferred taxes (*CEQ*+*TXDB*).
Cash flow	Compustat	The sum of earnings before extraordinary items and depreciation (*IB*+*DP*) divided by net property, plant, and equipment at the beginning of the fiscal year (*PPENT*).
Number of acquisitions	SDC Platinum	The total number of acquisitions in the fiscal year.
Leverage	Compustat	The sum of long-term debt and debt in current liabilities (*DLTT*+*DLC*) divided by the sum of long-term debt, debt in current liabilities, and the book value of common equity (*DLTT*+*DLC*+*CEQ*).
Interest coverage	Compustat	Earnings before depreciation, interest, and tax (*OIBDP*) divided by interest expense (*XINT*). We set interest coverage to zero for firms with negative *OIBDP* and positive *XINT*.

APPENDIX 1

VARIABLE DEFINITIONS

Variable Name	Source	Description
Cash holdings	Compustat	Cash and short-term investments (*CHE*) divided by lagged total assets (*AT*).
Dividends/earnings	Compustat	The sum of common dividends and preferred dividends (*DVC+DVP*) divided by earnings before depreciation, interest, and tax (*OIBDP*). We set this ratio to missing when it is negative.
Number of diversifying acquisitions	SDC Platinum	The total number of acquisitions in the fiscal year where the target's two-digit SIC differs from the acquirer's two-digit SIC.
R&D	Compustat	R&D expenditures (*XRD*) divided by lagged total assets (*AT*). Missing R&D is set to zero.
Advertising	Compustat	Advertising expenditures (*XAD*) divided by lagged total assets (*AT*). Missing advertising is set to zero.
SG&A	Compustat	Selling, general, and administrative expenditures (*XSGA*) divided by sales (*SALE*). Missing SG&A is set to zero.
Return on assets	Compustat	Earnings before depreciation, interest, and tax (*OIBDP*) divided by lagged total assets (*AT*).
Operating return on assets	Compustat	Operating cash flow (*OANCF*) divided by lagged total assets (*AT*).
Size	Compustat	The natural logarithm of total assets (*AT*).
Institutional holdings	CDA/Spectrum	Institutional holdings divided by the number of shares outstanding.
Percentage bid-ask spread	CRSP	We calculate the percentage bid-ask spread for each day t as the dollar spread divided by the midpoint of the bid and ask prices (Greene and Smart 1999; Garfinkel 2009). Then, we compute the average value across all days in fiscal year τ.
Analyst coverage	I/B/E/S	The number of analysts who cover firm i in fiscal year τ (*NUMEST)*.

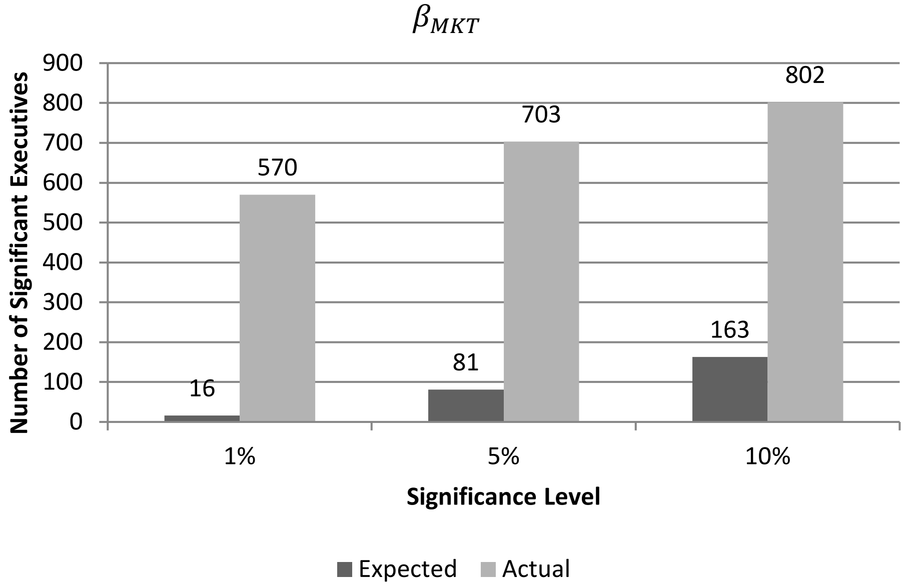
APPENDIX 1

VARIABLE DEFINITIONS

Variable Name	Source	Description
RPE	ISS	An indicator variable that equals one if firm i issued a relative performance evaluation grant in fiscal year τ, and zero otherwise.
Underperform	CRSP	An indicator variable that equals one if firm i underperformed its industry peers in fiscal year τ, and zero otherwise. A firm underperformed its industry peers if its total stock return is lower than the equal-weighted stock return for its industry.
Value-weighted market return	CRSP	Value-weighted return to the market (*VWRETD*) cumulated over the past 12 months.
Independent board	BoardEx	An indicator variable that equals one if more than 50% of the directors on firm i's board are independent, and zero otherwise (Shivdasani and Yermack 1999; Chen, Cheng, and Wang 2015).
Board member	Execucomp	An indicator variable that equals one if manager j is a member of firm i's board of directors, and zero otherwise (Gayle, Golan, and Miller 2015).
Male	Execucomp	An indicator variable that equals one if manager j is male, and zero otherwise.
Birth year	Execucomp	Manager j's birth year.
Recession	Execucomp	An indicator variable that equals one if manager j's birth year plus 24 is a recession year, and zero otherwise (Schoar and Zuo 2017). Recession years are based on the business cycle dating database of the National Bureau of Economic Research (NBER). Recession years include the trough of the business cycle and all years leading to the trough (excluding the peak of the business cycle).

FIGURE 1

FREQUENCY OF SIGNIFICANT EXECUTIVE FIXED EFFECTS

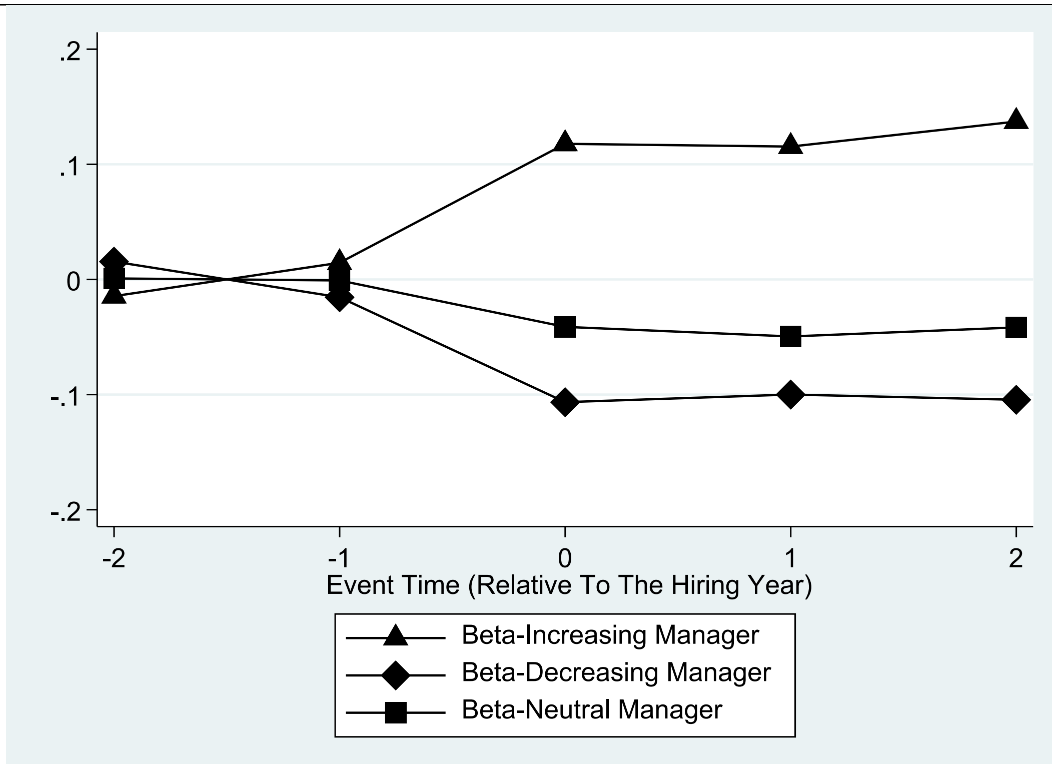


Notes:

Figure 1 reports the actual number of significant manager fixed effects and the expected number of significant manager fixed effects. The significance of manager fixed effects is determined using heteroskedasticity-consistent standard errors clustered at the firm-level.

FIGURE 2

CHANGE IN BETA SURROUNDING EXECUTIVE TRANSITIONS

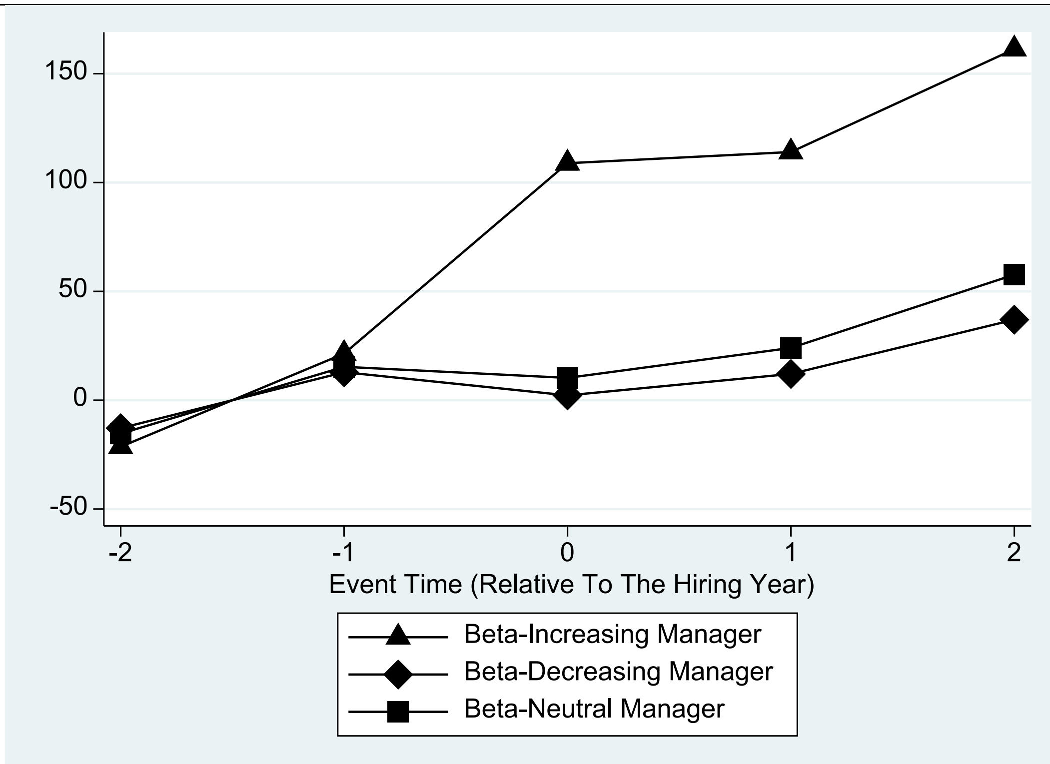


Notes:

Figure 2 plots the evolution of β_{MKT} for three groups: (1) managers with positive fixed effects that are significant at the 5 percent level (*Beta-Increasing Managers)*; (2) managers with negative fixed effects that are significant at the 5 percent level (*Beta-Decreasing Managers*); and (3) managers with fixed effects that are not significant at the 5 percent level (*Beta-Neutral Managers*). Year 0 denotes the hiring year. To construct this figure, we subtract the average value of beta measured over the interval [-2, -1] from the raw value of beta for each firm-year. Thus, the value of beta over the interval [0, 2] represents the change in beta from the firm's average beta before the executive joined the firm.

FIGURE 3

CHANGE IN *CAPEX* SURROUNDING EXECUTIVE TRANSITIONS



Notes:

Figure 3 plots the evolution of *CAPEX* for three groups: (1) managers with positive fixed effects that are significant at the 5 percent level (*Beta-Increasing Managers)*; (2) managers with negative fixed effects that are significant at the 5 percent level (*Beta-Decreasing Managers*); and (3) managers with fixed effects that are not significant at the 5 percent level (*Beta-Neutral Managers*). Year 0 denotes the hiring year. To construct this figure, we subtract the average value of *CAPEX* measured over the interval [-2, -1] from the raw value of *CAPEX* for each firm-year. Thus, the value of *CAPEX* over the interval [0, 2] represents the change in *CAPEX* from the firm's average *CAPEX* before the executive joined the firm.

TABLE 1

EXECUTIVE TRANSITIONS BETWEEN POSITIONS

To:	CEO	CFO	Other	Total
From:				
CEO	132	0	82	214
CFO	41	340	59	440
Other	409	74	546	1,029
Total	582	414	687	1,683

Notes:
This table summarizes executive transitions in our sample. Each manager in our sample works at least three years at two or more firms. When a manager works at three or more firms (i.e., moves more than once), we analyze the last move only. Each cell reports the number of transitions from the row position to the column position. “Other” refers to miscellaneous job titles, such as Chief Operating Officer, Corporate Secretary, General Counsel, and various subdivision Presidents or Vice-Presidents (e.g., human resources, research and development, and marketing).

TABLE 2

DESCRIPTIVE STATISTICS

	N	Mean	SD	p25	p50	p75
$TVOL$	23,762	0.027	0.014	0.018	0.024	0.033
β_{MKT}	23,762	1.082	0.521	0.722	1.021	1.366
$IVOL$	23,762	0.024	0.013	0.015	0.021	0.030
Investment	24,109	0.307	0.322	0.137	0.215	0.355
N of acquisitions	25,266	0.362	0.544	0.000	0.000	0.693
Leverage	24,415	0.353	0.313	0.103	0.326	0.500
Interest coverage	22,401	2.514	1.412	1.694	2.332	3.108
Cash holdings	24,327	0.180	0.269	0.028	0.089	0.233
Dividends/earnings	23,982	0.082	0.151	0.000	0.019	0.123
N of diversifying acquis.	25,266	0.170	0.382	0.000	0.000	0.000
R&D	24,346	0.039	0.072	0.000	0.004	0.047
Advertising	24,346	0.015	0.036	0.000	0.000	0.012
SG&A	24,482	0.239	0.181	0.106	0.209	0.333
Return on assets	24,275	0.164	0.122	0.098	0.153	0.221
Operating return on assets	24,297	0.115	0.105	0.061	0.109	0.166

Notes:
This table presents summary statistics for the sample of firms that employ a mover at some point during our sample period. All variables are defined in Appendix 1.

TABLE 3

EXECUTIVE FIXED EFFECTS ON RISK

	F-tests on fixed effects for				
	CEOs	*CFOs*	*Other executives*	*N*	*Adjusted* R^2
$TVOL$				23,762	.6199
$TVOL$	4.69 (<.0001, 563)			23,762	.6374
$TVOL$	3.86 (<.0001, 563)	4.53 (<.0001, 410)	8.72 (<.0001, 655)	23,762	.6655
β_{MKT}				23,762	.4294
β_{MKT}	5.00 (<.0001, 563)			23,762	.4560
β_{MKT}	4.50 (<.0001, 563)	6.14 (<.0001, 410)	4.60 (<.0001, 655)	23,762	.5010
$IVOL$				23,762	.6162
$IVOL$	4.21 (<.0001, 563)			23,762	.6330
$IVOL$	3.70 (<.0001, 563)	4.09 (<.0001, 410)	9.86 (<.0001, 655)	23,762	.6605

Notes:

Using the sample of firm-years with non-missing data, we estimate the following regression:

$$Risk_{i\tau} = \alpha_\tau + \gamma_i + \lambda_{CEO} + \lambda_{CFO} + \lambda_{Other} + \varepsilon_{i\tau}$$

α_τ are year fixed effects, γ_i are firm fixed effects, and λ are manager fixed effects. The first row for each variable excludes manager fixed effects. The second row includes CEO fixed effects and the third row includes fixed effects for all three groups of managers (CEO, CFO, Other). The middle columns report the results from F-tests for the joint significance of the manager fixed effects. For each F-test, we report the F-statistic, p-value, and number of constraints.

TABLE 4

DISTRIBUTION OF EXECUTIVE FIXED EFFECTS

	N	Mean	SD	p25	p50	p75
$TVOL$	1,628	-0.001	0.006	-0.004	0.000	0.003
β_{MKT}	1,628	-0.011	0.303	-0.201	-0.008	0.161
$IVOL$	1,628	-0.001	0.006	-0.004	-0.001	0.002
Investment	1,600	0.004	0.134	-0.046	0.009	0.057
Inv to Q sensitivity	1,621	-0.011	0.381	-0.093	-0.007	0.066
Inv to CF sensitivity	1,621	-0.017	0.820	-0.098	-0.016	0.060
N of acquisitions	1,640	-0.008	0.329	-0.139	-0.014	0.140
Leverage	1,638	0.002	0.140	-0.060	0.002	0.076
Interest coverage	1,615	-0.047	0.591	-0.282	-0.031	0.204
Cash holdings	1,639	-0.001	0.103	-0.044	0.000	0.043
Dividends/earnings	1,636	-0.002	0.133	-0.023	0.002	0.020
N of diversifying acquis.	1,639	0.003	0.201	-0.069	-0.007	0.062
R&D	1,639	0.001	0.019	-0.006	0.001	0.008
Advertising	1,639	0.000	0.008	-0.001	0.000	0.002
SG&A	1,639	-0.002	0.045	-0.017	-0.001	0.013
Return on assets	1,640	0.003	0.065	-0.027	0.002	0.034
Operating return on assets	1,640	0.003	0.058	-0.025	0.001	0.028

Notes:

This table presents the distribution of the manager fixed effects estimated in Table 3, as well as the distribution of the manager fixed effects studied in Bertrand and Schoar (2003). For brevity, we do not report the estimation of the latter. For details on each corporate policy regression, please refer to Bertrand and Schoar (2003). We weight each manager fixed effect by the inverse of its standard error to account for estimation error.

TABLE 5

STOCK RETURNS AND EXECUTIVE FIXED EFFECTS ON RISK

	$FE(RET)$	$FE(RET)$	$FE(RET)$
$FE(TVOL)$	0.024		
	(0.052)		
$FE(\beta_{MKT})$		0.138***	
		(0.046)	
$FE(IVOL)$			-0.005
			(0.055)
N	1,615	1,615	1,615
R^2	0.001	0.018	0.000

Notes:

*, **, and *** indicate significance at the 10 percent, 5 percent, and 1 percent levels, respectively. We standardize the fixed effects estimated in Table 3 to have zero mean and unit variance. Then, we estimate the following weighted least squares regression:

$$FE(RET)_j = \alpha + \delta_1 FE(Risk)_j + \varepsilon_j$$

where j indexes managers. We weight each observation by the inverse of the standard error of the independent variable. Each column in Table 5 reports the coefficients from a different univariate regression.

TABLE 6

MECHANISM: EXECUTIVE FIXED EFFECTS ON CORPORATE POLICIES

Panel A: Factor Loadings

	Factor 1	Factor 2	Factor 3
Investment	0.047	-0.052	**0.326**
Inv to Q sensitivity	-0.010	0.054	-0.048
Inv to CF sensitivity	-0.010	0.025	0.021
N of acquisitions	**1.000**	-0.002	0.000
Leverage	-0.063	**-0.452**	-0.117
Interest coverage	0.015	**1.000**	0.000
Cash holdings	0.022	0.082	**0.755**
Dividends/earnings	-0.048	0.020	0.058
N of diversifying acquis.	**0.756**	-0.012	0.021
R&D	0.030	0.032	**0.591**
Advertising	0.060	-0.004	0.133
SG&A	0.014	0.002	0.008

TABLE 6

MECHANISM: EXECUTIVE FIXED EFFECTS ON CORPORATE POLICIES

Panel B: Eigenvalues and Variance Explained

	Eigenvalue	Pct. Explained	Cumulative Pct.
Factor 1 (external growth)	1.585	0.132	0.132
Factor 2 (financial conservatism)	1.219	0.102	0.234
Factor 3 (internal growth)	1.063	0.089	0.322

Notes:
We perform factor analysis on the manager fixed effects studied in Bertrand and Schoar (2003). Our results are obtained using Stata's *factor* command with the *ml* and *altdivisor* options (Kaplan and Sorensen 2021). All factors are non-rotated; however, our results are not sensitive to factor rotation. Using a Scree test (Cattell 1966), we determine that there are three factors. Panel A reports the factor loadings of the three factors. Factor loadings greater than 0.15 in absolute value are bolded. Panel B reports the eigenvalues and the proportion of variation explained by the three factors.

TABLE 6

MECHANISM: EXECUTIVE FIXED EFFECTS ON CORPORATE POLICIES

Panel C: Relation Between Factors and Executive Fixed Effects on Risk

	$FE(TVOL)$	$FE(\beta_{MKT})$	$FE(IVOL)$
Factor 1 (external growth)	-0.026	-0.021	-0.053
	(0.036)	(0.041)	(0.034)
Factor 2 (financial conservatism)	-0.133***	-0.069*	-0.125***
	(0.040)	(0.039)	(0.038)
Factor 3 (internal growth)	0.129**	0.259***	0.102
	(0.066)	(0.066)	(0.063)
$FE(ROA)$	-0.176***	-0.012	-0.168***
	(0.039)	(0.054)	(0.042)
N	1,548	1,548	1,548
R^2	0.074	0.041	0.070

Notes:

*, **, and *** indicate significance at the 10 percent, 5 percent, and 1 percent levels, respectively. We standardize the fixed effects estimated in Table 3 to have zero mean and unit variance. Then, we estimate the following weighted least squares regression:

$$FE(Risk)_j = \alpha + \delta_1 Factor_{1j} + \delta_2 Factor_{2j} + \delta_3 Factor_{3j} + \delta_4 FE(ROA)_j + \varepsilon_j$$

where j indexes managers. We weight each observation by the inverse of the standard error of the independent variable. Each column in Panel C of Table 6 reports the coefficients from a different multiple regression.

TABLE 7

MECHANISM: FIRM-LEVEL DETERMINANTS OF BETA

	F-tests on fixed effects for				
	CEOs	*CFOs*	*Other executives*	*N*	*Adjusted* R^2
$TVOL$				22,382	.6685
$TVOL$	4.75 (<.0001, 556)			22,382	.6811
$TVOL$	4.19 (<.0001, 556)	6.08 (<.0001, 410)	10.65 (<.0001, 648)	22,382	.7056
β_{MKT}				22,382	.4465
β_{MKT}	4.99 (<.0001, 556)			22,382	.4726
β_{MKT}	4.45 (<.0001, 556)	5.92 (<.0001, 410)	4.71 (<.0001, 648)	22,382	.5151
$IVOL$				22,382	.6855
$IVOL$	4.26 (<.0001, 556)			22,382	.6960
$IVOL$	4.05 (<.0001, 556)	6.35 (<.0001, 410)	10.75 (<.0001, 648)	22,382	.7175

Notes:

Using the sample of firm-years with non-missing data, we estimate the following regression:

$$Risk_{i\tau} = \alpha_\tau + \gamma_i + \boldsymbol{\beta X}_{i\tau} + \lambda_{CEO} + \lambda_{CFO} + \lambda_{Other} + \varepsilon_{i\tau}$$

α_τ are year fixed effects, γ_i are firm fixed effects, λ are manager fixed effects, and $\boldsymbol{X}_{i\tau}$ is a vector of time-varying firm characteristics (size, book-to-market, and leverage). The first row for each variable excludes manager fixed effects. The second row includes CEO fixed effects and the third row includes fixed effects for all three groups of managers (CEO, CFO, Other). The middle columns report the results from *F*-tests for the joint significance of the manager fixed effects. For each *F*-test, we report the *F*-statistic, *p*-value, and number of constraints.

TABLE 8

MECHANISM: EXECUTIVE FIXED EFFECTS ON UNLEVERED BETA

	F-tests on fixed effects for				
	CEOs	*CFOs*	*Other executives*	*N*	*Adjusted R^2*
β^U_{MKT}				22,405	.4335
β^U_{MKT}	5.32 (<.0001, 561)			22,405	.4535
β^U_{MKT}	5.59 (<.0001, 561)	4.28 (<.0001, 409)	6.88 (<.0001, 649)	22,405	.4941

Notes:

Using the sample of firm-years with non-missing data, we estimate the following regression:

$$Risk_{i\tau} = \alpha_\tau + \gamma_i + \lambda_{CEO} + \lambda_{CFO} + \lambda_{Other} + \varepsilon_{i\tau}$$

α_τ are year fixed effects, γ_i are firm fixed effects, and λ are manager fixed effects. The first row excludes manager fixed effects. The second row includes CEO fixed effects and the third row includes fixed effects for all three groups of managers (CEO, CFO, Other). The middle columns report the results from *F*-tests for the joint significance of the manager fixed effects. For each *F*-test, we report the *F*-statistic, *p*-value, and number of constraints.

TABLE 9

EXECUTIVE CHARACTERISTICS

Panel A: Descriptive Statistics

	N	Mean	SD	p25	p50	p75
Male	1,536	0.937	0.243	1.000	1.000	1.000
Recession	1,536	0.237	0.425	0.000	0.000	0.000
Birth Year	1,536	1953	8.268	1948	1954	1959

Notes:

This table presents summary statistics for the sample of managers for whom we were able to estimate manager fixed effects. All variables are defined in Appendix 1.

TABLE 9

EXECUTIVE CHARACTERISTICS

Panel B: Relation Between Executive Characteristics and Executive Fixed Effects on Risk			
	$FE(TVOL)$	$FE(\beta_{MKT})$	$FE(IVOL)$
Male	-0.160	0.008	-0.135
	(0.190)	(0.144)	(0.192)
Recession	-0.120	-0.240**	-0.037
	(0.100)	(0.100)	(0.099)
Birth Year	-0.005	0.007	-0.003
	(0.013)	(0.014)	(0.013)
Industry Fixed Effects	Yes	Yes	Yes
Decade Fixed Effects	Yes	Yes	Yes
N	1,536	1,536	1,536
R^2	0.081	0.099	0.069

Notes:

*, **, and *** indicate significance at the 10 percent, 5 percent, and 1 percent levels, respectively. We standardize the fixed effects estimated in Table 3 to have zero mean and unit variance. Then, we estimate the following weighted least squares regression

$$FE(Risk)_j = \alpha + \delta Male_j + \eta Recession_j + \gamma Birth\,Year_j + \varepsilon_j$$

where j indexes managers. We weight each observation by the inverse of the standard error of the independent variable. Decade fixed effects are based on the decade in which the manager was born. Industry fixed effects are based on the industry (two-digit SIC) of the last firm we observe each manager in. Each column in Table 9 reports the coefficients from a different multiple regression.

TABLE 10

EXECUTIVE DISCRETION

	$\lvert FE(TVOL)\rvert$	$\lvert FE(\beta_{MKT})\rvert$	$\lvert FE(IVOL)\rvert$
Size	-0.032*	-0.070***	-0.035*
	(0.019)	(0.027)	(0.019)
Return on assets	-0.214	-0.536**	-0.092
	(0.162)	(0.256)	(0.170)
Leverage	-0.011	0.011	-0.002
	(0.018)	(0.017)	(0.020)
Tobin's Q	-0.018	0.009	-0.022
	(0.013)	(0.029)	(0.013)
Institutional holdings	-0.037	0.090	0.025
	(0.178)	(0.165)	(0.171)
Percentage bid-ask spread	-2.102	-0.278	-3.815
	(3.800)	(3.448)	(3.783)
Analyst coverage	-0.002	0.008	-0.004
	(0.004)	(0.005)	(0.004)
RPE	0.008	0.003	0.037
	(0.064)	(0.093)	(0.063)
Underperform	0.027	0.019	0.009
	(0.045)	(0.058)	(0.045)
Value-weighted market return	-0.330	-0.026	-0.325
	(0.208)	(0.176)	(0.205)
Independent board	-0.202***	-0.210***	-0.250***
	(0.069)	(0.074)	(0.071)
Board member	0.080	-0.059	0.106*
	(0.061)	(0.062)	(0.061)
N	1,048	1,048	1,048
R^2	0.067	0.056	0.074

Notes:

*, **, and *** indicate significance at the 10 percent, 5 percent, and 1 percent levels, respectively. We standardize the fixed effects estimated in Table 3 to have zero mean and unit variance. Then, we estimate the following weighted least squares regression:

$$\begin{aligned} \left|FE(Risk)_j\right| = \alpha + \delta Firm_{ij\tau-1} + \eta VWRet_{\tau-1} \\ + \theta Independent\ Board_{ij\tau} \\ + \varphi Board\ Member_{j\tau} + \varepsilon_j \end{aligned}$$

i, j, and τ index firms, managers, and years, respectively. We weight each observation by the inverse of the standard error of the independent variable. Each column in Table 10 reports the coefficients from a different multiple regression. The dependent variable is the absolute value of the manager fixed effect on the column variable. *Firm* is a vector of firm-level variables: firm size, return on assets, leverage, Tobin's *Q*, institutional holdings, percentage bid-ask spread, analyst coverage, whether the firm underperformed its peers, and whether the firm uses RPE. *VWRet* is the return on the CRSP value-weighted market portfolio. *Independent Board* is an indicator variable that equals one if more than 50% of the directors on firm *i*'s board are independent, and zero otherwise. *Board Member* is an indicator variable that equals one if manager *j* is a member of firm *i*'s board of directors, and zero otherwise. We measure *Firm*, *Independent Board*, and *Board Member* in the last firm we observe each manager in. *Independent Board* and *Board Member* are measured in the year that the executive joins her firm. *Firm* and *VWRet* are measured in the year before the executive transition.

TABLE 11

HIRING PREFERENCES

	$FE(TVOL)$	$FE(\beta_{MKT})$	$FE(IVOL)$
Size	0.048	0.120***	0.048
	(0.032)	(0.041)	(0.031)
Return on assets	-0.637**	-0.245	-0.516
	(0.322)	(0.457)	(0.323)
Leverage	0.057	0.012	0.048
	(0.054)	(0.039)	(0.043)
Tobin's Q	0.043*	0.075	0.021
	(0.025)	(0.047)	(0.025)
Institutional holdings	0.381	0.381	0.295
	(0.264)	(0.244)	(0.257)
Percentage bid-ask spread	2.801	11.003	5.336
	(6.850)	(7.225)	(6.211)
Analyst coverage	-0.003	-0.017**	-0.005
	(0.007)	(0.008)	(0.006)
RPE	0.081	0.000	0.064
	(0.104)	(0.130)	(0.100)
Underperform	-0.010	0.011	-0.020
	(0.075)	(0.088)	(0.074)
Value-weighted market return	0.187	-0.018	0.288
	(0.315)	(0.269)	(0.312)
Independent board	0.078	0.092	0.119
	(0.109)	(0.117)	(0.110)
Board member	-0.082	-0.038	-0.052
	(0.092)	(0.091)	(0.093)
N	1,048	1,048	1,048
R^2	0.029	0.032	0.024

Notes:
*, **, and *** indicate significance at the 10 percent, 5 percent, and 1 percent levels, respectively. We standardize the fixed effects estimated in Table 3 to have zero mean and unit variance. Then, we estimate the following weighted least squares regression:

$$
\begin{aligned}
FE(Risk)_j = \alpha &+ \delta Firm_{ij\tau-1} + \eta VWRet_{\tau-1} \\
&+ \theta Independent\ Board_{ij\tau} \\
&+ \varphi Board\ Member_{j\tau} + \varepsilon_j
\end{aligned}
$$

i, j, and τ index firms, managers, and years, respectively. We weight each observation by the inverse of the standard error of the independent variable. Each column in Table 11 reports the coefficients from a different multiple regression. The dependent variable is the signed manager fixed effect on the column variable. *Firm* is a vector of firm-level variables: firm size, return on assets, leverage, Tobin's *Q*, institutional holdings, percentage bid-ask spread, analyst coverage, whether the firm underperformed its peers, and whether the firm uses RPE. *VWRet* is the return on the CRSP value-weighted market portfolio. *Independent Board* is an indicator variable that equals one if more than 50% of the directors on firm *i*'s board are independent, and zero otherwise. *Board Member* is an indicator variable that equals one if manager *j* is a member of firm *i*'s board of directors, and zero otherwise. We measure *Firm*, *Independent Board*, and *Board Member* in the last firm we observe each manager in. *Independent Board* and *Board Member* are measured in the year that the executive joins her firm. *Firm* and *VWRet* are measured in the year before the executive transition.

Online Appendix

"The Effect of Managers on Systematic Risk"

1 Infrequent Trading

When a stock is infrequently traded, estimates of systematic risk may be biased. This concern is unlikely to confound our results since Execucomp tracks firms in the S&P 1500 and we use a relatively recent sample period (1992 to 2016). Nevertheless, we ensure the robustness of our results using Dimson's (1979) procedure. Formally, we estimate the following time-series regression for each firm-year.

$$R_{it\tau} - R_{ft\tau} = \alpha_{i\tau} + \beta_{i\tau}^{0}\left(R_{mt\tau} - R_{ft\tau}\right) + \sum_{k=1}^{4} \beta_{i\tau}^{k}\left(R_{m,t-k,\tau} - R_{f,t-k,\tau}\right) + \varepsilon_{it\tau} \qquad \text{(A1)}$$

$R_{it\tau}$ is firm *i*'s stock return on day *t* in year τ; $R_{ft\tau}$ is the risk-free rate on day *t* in year τ; and $R_{mt\tau}$ is the return of the market portfolio on day *t* in year τ. We include four lags of market returns in equation (A1) following Lewellen and Nagel (2006), but we do not impose the constraint that lags two to four have the same slope. $\beta_{MKT,DIMSON}$ is the slope coefficient on the current excess return to the market ($\beta_{i\tau}^{0}$) plus all of the slope coefficients on the lagged excess returns to the market ($\beta_{i\tau}^{1} + \beta_{i\tau}^{2} + \beta_{i\tau}^{3} + \beta_{i\tau}^{4}$).

Table A1 reports the results from estimating our baseline specification for $\beta_{MKT,DIMSON}$. When we include fixed effects for all three groups of managers, adjusted R^2 increases by 4.69 (37.16–32.47) percentage points, which is equivalent to 14.44 percent (4.69/32.47) increase relative to the base model.

Figure A1 reports the actual and expected number of significant manager fixed effects. When we use $\beta_{MKT,DIMSON}$ as the dependent variable, 549 manager fixed effects are significant at the 1 percent level, 689 manager fixed effects are significant at the 5 percent level, and 788 manager fixed effects are significant at the 10 percent level.

2 Fama-French Six-Factor Model

Drawing on Merton's (1973) Intertemporal Capital Asset Pricing Model (ICAPM) and Ross' (1976) Arbitrage Pricing Theory (APT), several multifactor models have been proposed (e.g., Fama and French 1993, 2015, 2018). In this section, we examine whether our results generalize to the Fama-French Six-Factor Model – one of the most recently adopted models in the asset pricing literature. We begin by estimating asset-specific factor loadings using the following time-series regression for each firm-year:

$$\begin{aligned} R_{it\tau} - R_{ft\tau} = \alpha_{i\tau} &+ \beta_{i\tau}^{MKT} MKT_{t\tau} + \beta_{i\tau}^{SMB} SMB_{t\tau} + \beta_{i\tau}^{HML} HML_{t\tau} \\ &+ \beta_{i\tau}^{RMW} RMW_{t\tau} + \beta_{i\tau}^{CMA} CMA_{t\tau} + \beta_{i\tau}^{UMD} UMD_{t\tau} \\ &+ \varepsilon_{it\tau} \end{aligned} \tag{A2}$$

$R_{it\tau}$ is firm *i*'s stock return on day *t* in year τ; $R_{ft\tau}$ is the risk-free rate on day *t* in year τ; $MKT_{t\tau}$ is the excess return of the market portfolio; $SMB_{t\tau}$ is the return to a diversified portfolio that is long in small (low market capitalization) firms and short in big (high market capitalization) firms; $HML_{t\tau}$ is the return to a diversified portfolio that is long in high book-to-market (value) firms and short in low book-to-market (growth) firms; $RMW_{t\tau}$ is the return to a diversified portfolio that is long in firms that have robust (high) operating profitability and short in firms that have weak (low) operating profitability; $CMA_{t\tau}$ is the return to a diversified portfolio that is long in firms that have conservative (low) investment and short in firms that have aggressive (high) investment; and $UMD_{t\tau}$ is the return to a diversified portfolio that is long in firms that performed well during the previous 12 months and short in firms that performed poorly during the previous 12 months. The slope coefficients ($\beta_{i\tau}^{MKT}$, $\beta_{i\tau}^{SMB}$, $\beta_{i\tau}^{HML}$, $\beta_{i\tau}^{RMW}$, $\beta_{i\tau}^{CMA}$, and $\beta_{i\tau}^{UMD}$) are asset-specific sensitivities to the six factors of Fama and French (2018).

Table A2 reports the results from estimating equations (3), (4), and (5) for the Fama-French (2018) factor loadings. Adjusted R^2 increases by 3.03 percentage points, 2.58 percentage points, 2.09 percentage points, 2.05 percentage points, 5.10 percentage points, and 3.11 percentage points for $\beta_{MKT,FF6}$, $\beta_{SMB,FF6}$, $\beta_{HML,FF6}$, $\beta_{RMW,FF6}$, $\beta_{CMA,FF6}$, and $\beta_{UMD,FF6}$, respectively. This is equivalent to a 14.57 percent (3.03/20.80), 6.15 percent (2.58/41.96), 9.02 percent (2.09/23.17), 8.76 percent (2.05/23.41), 41.13 percent (5.10/12.44), and 53.07 percent (3.11/5.876) increase in adjusted R^2 relative to each factor loading's base model. While manager fixed effects improve the explanatory power for all of the Fama-French (2018) factor loadings, our results are most pronounced for the CMA investment factor.

Figure A2 reports the actual and expected number of significant manager fixed effects. When we use $\beta_{MKT,FF6}$ as the dependent variable, 586 manager fixed effects are significant at the 1 percent level, 734 manager fixed effects are significant at the 5 percent level, and 820 manager fixed effects are significant at the 10 percent level. When we use $\beta_{SMB,FF6}$ as the dependent variable, 558 manager fixed effects are significant at the 1 percent level, 711 manager fixed effects are significant at the 5 percent level, and 812 manager fixed effects are significant at the 10 percent level. When we use $\beta_{HML,FF6}$ as the dependent variable, 579 manager fixed effects are significant at the 1 percent level, 730 manager fixed effects are significant at the 5 percent level, and 823 manager fixed effects are significant at the 10 percent level. When we use $\beta_{RMW,FF6}$ as the dependent variable, 554 manager fixed effects are significant at the 1 percent level, 702 manager fixed effects are significant at the 5 percent level, and 792 manager fixed effects are significant at the 10 percent level. When we use $\beta_{CMA,FF6}$ as the dependent variable, 562 manager fixed effects are significant at the 1 percent level, 712 manager fixed effects are significant at the 5 percent level, and 802 manager fixed effects are significant at the 10 percent level. Lastly, when we use $\beta_{UMD,FF6}$ as the dependent variable, 582 manager fixed effects are significant at the 1 percent level, 702 manager fixed effects are significant at the 5 percent level, and 803 manager fixed effects are significant at the 10 percent level.

Note that there is a fundamental difference between characteristics and factor loadings (Daniel and Titman 1997; Fama and French 2020). There is a mechanical relation between characteristics and factor loadings at the portfolio level, but such a relation need not exist at the firm level. Consider market capitalization and SMB. The loading on SMB must be higher for small firms than for big firms, *on average*. However, a large firm can have a large loading on SMB and a small firm can have a small loading on SMB. For example, a small firm that sells most of its products to Apple may move more closely with the prices of large firms than with the prices of other small firms. Our analysis explores whether a small firm moves more closely with the prices of large firms when a small firm employs a manager who has a "large-firm" management style.

3 Event-Time Analysis

Figure A3 plots the evolution of asset sales in event-time surrounding executive transitions. We begin by classifying managers into three groups based on the sign and the significance of the manager fixed effects estimated in Table 3: *Beta-Increasing Managers* are managers with positive fixed effects that are significant at the 5 percent level; *Beta-Decreasing Managers* are managers with negative fixed effects that are significant at the 5 percent level; and *Beta-Neutral Managers* are managers with fixed effects that are not significant at the 5 percent level (either positive or negative). If a firm employs one of these managers, we collect asset sales for the period [–2, +2], where 0 denotes the hiring year. Then, we subtract the average value of asset sales measured over the interval [-2, -1] from the raw value of asset sales for each firm-year. Figure A3 plots these values for the full interval [–2, +2]. Thus, the value of asset sales over the interval [0, 2] represents the change in asset sales from the firm's average asset sales before the executive joined the firm.

In a similar fashion, we plot the evolution of R&D in Figure A4 and we plot the number of acquisitions in Figure A5. Overall, we do not observe a clear pattern of results for asset sales, R&D, and acquisitions.

In Figure A6, we partition the sample into four groups: (1) firms that hire a *Beta-Increasing Manager* and underperformed their industry peers in the year before the executive transition, (2) firms that hire a *Beta-Increasing Manager* and outperformed their industry peers in the year before the executive transition, (3) firms that hire a *Beta-Decreasing Manager* and underperformed their industry peers in the year before the executive transition, and (4) firms that hire a *Beta-Decreasing Manager* and outperformed their industry peers in the year before the executive transition. For each of these cases, we collect β_{MKT} for the period [–2, +2], where 0 denotes the hiring year. Then, we subtract the average value of β_{MKT} measured over the interval [-2, -1] from the raw value of β_{MKT} for each firm-year. Figure A6 plots these values for the full interval [–2, +2]. Thus, the value of beta over the interval [0, 2] represents the change in beta from the firm's average beta before the executive joined the firm. The evidence in Figure A6 suggests that the effect of beta-increasing managers is more pronounced if the hiring firm underperformed its industry peers in the year before the executive transition. One way of interpreting this finding is that firms that underperform their industry peers likely have poor idiosyncratic performance; as a result, it is more beneficial for these firms to increase their exposure to market risk. On the contrary, firms that outperform their industry peers likely have good idiosyncratic performance; as a result, it is less beneficial for these firms to increase their exposure to market risk.

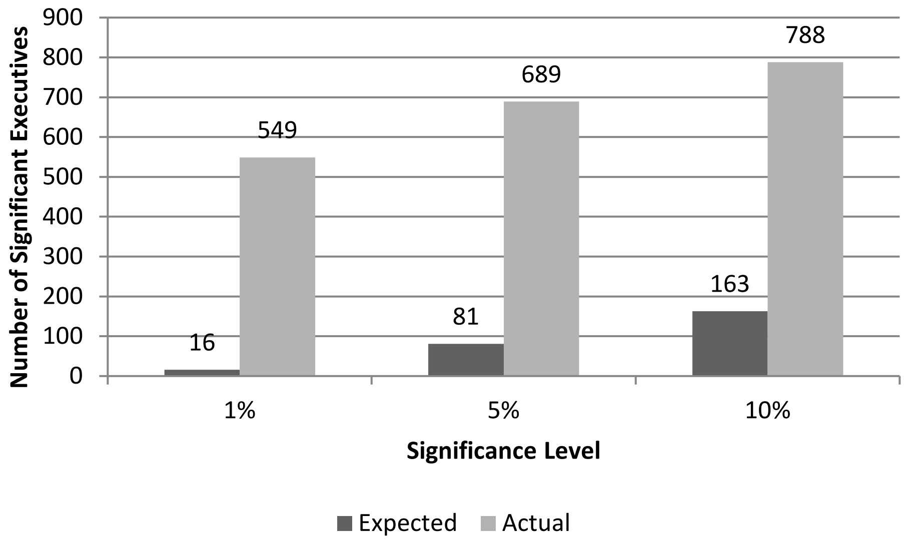
We perform a similar analysis in Figure A7, but we partition based on board independence rather than on performance relative to industry peers. More specifically, we plot the evolution of beta for four groups: (1) firms that hire a *Beta-Increasing Manager* and have an independent board,

(2) firms that hire a *Beta-Increasing Manager* and do not have an independent board, (3) firms that hire a *Beta-Decreasing Manager* and have an independent board, and (4) firms that hire a *Beta-Decreasing Manager* and do not have an independent board. The results in Table A7 suggests that the effect of beta-decreasing managers is less pronounced when a firm has an independent board.

FIGURE A1

ROBUSTNESS: INFREQUENT TRADING

$\beta_{MKT,DIMSON}$



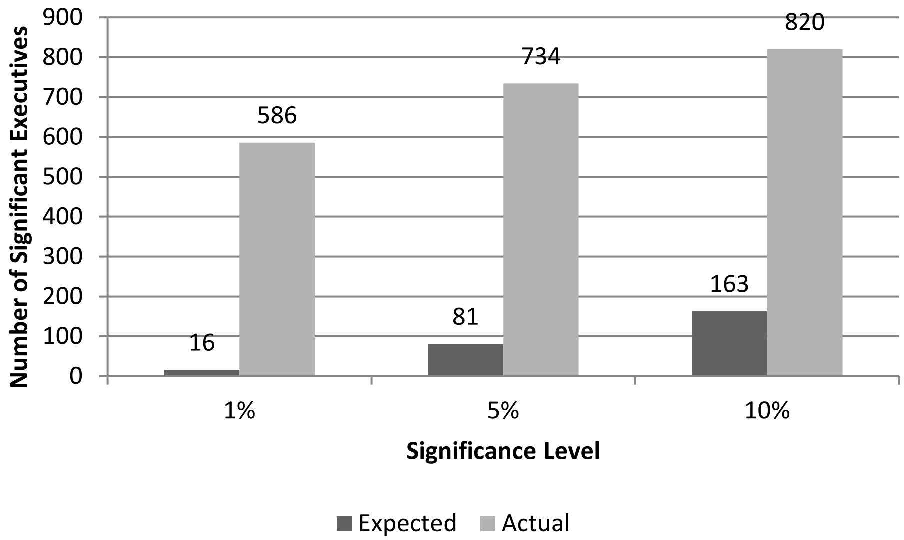
Notes:

Figure A1 reports the actual number of significant manager fixed effects and the expected number of significant manager fixed effects. The significance of manager fixed effects is determined using heteroskedasticity-consistent standard errors clustered at the firm-level.

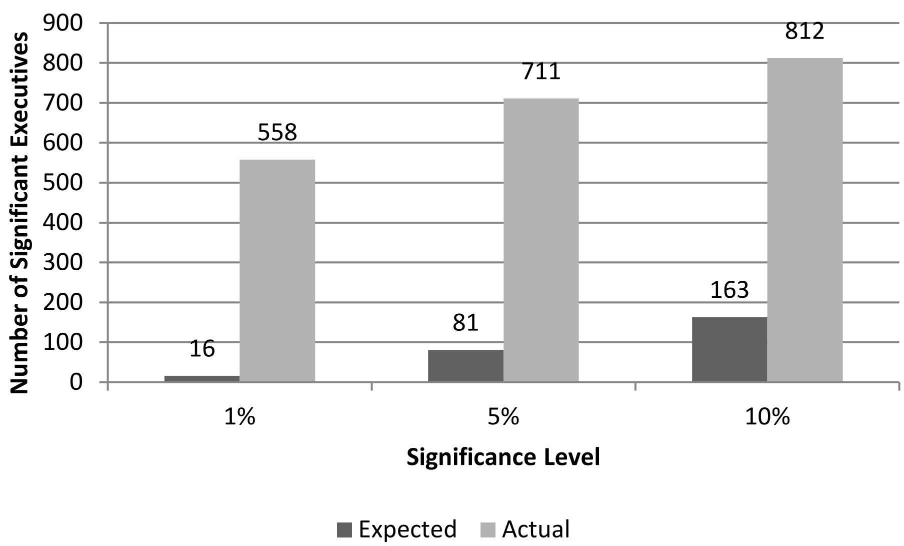
FIGURE A2

ROBUSTNESS: FAMA-FRENCH SIX-FACTOR MODEL

$\beta_{MKT,FF6}$



$\beta_{SMB,FF6}$

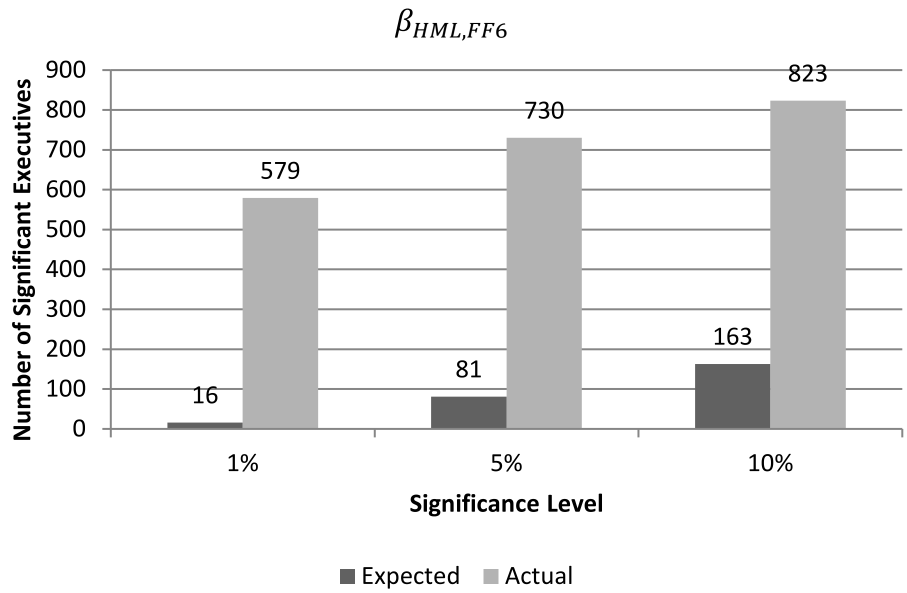


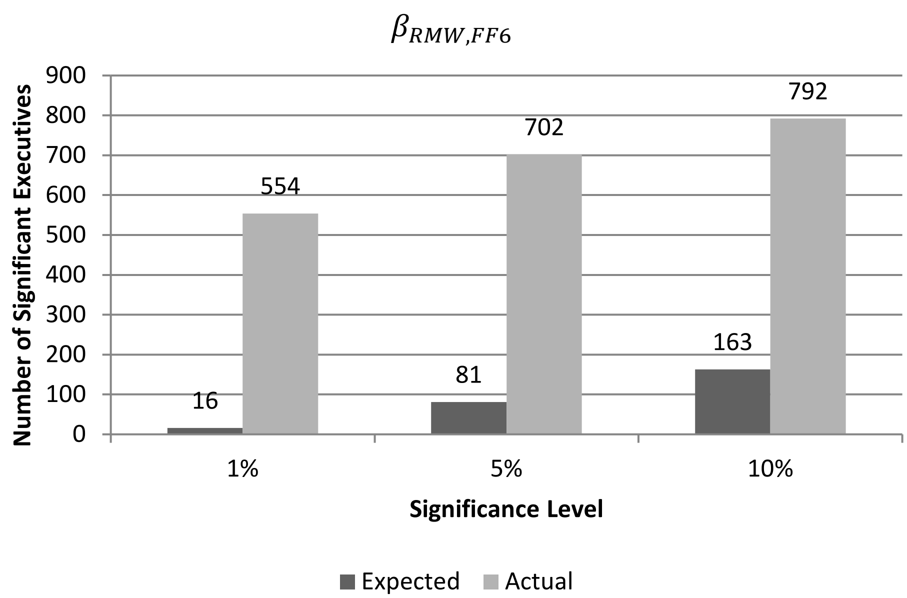
Notes:

Figure A2 reports the actual number of significant manager fixed effects and the expected number of significant manager fixed effects. The significance of manager fixed effects is determined using heteroskedasticity-consistent standard errors clustered at the firm-level.

FIGURE A2 (CONTINUED)

ROBUSTNESS: FAMA-FRENCH SIX-FACTOR MODEL

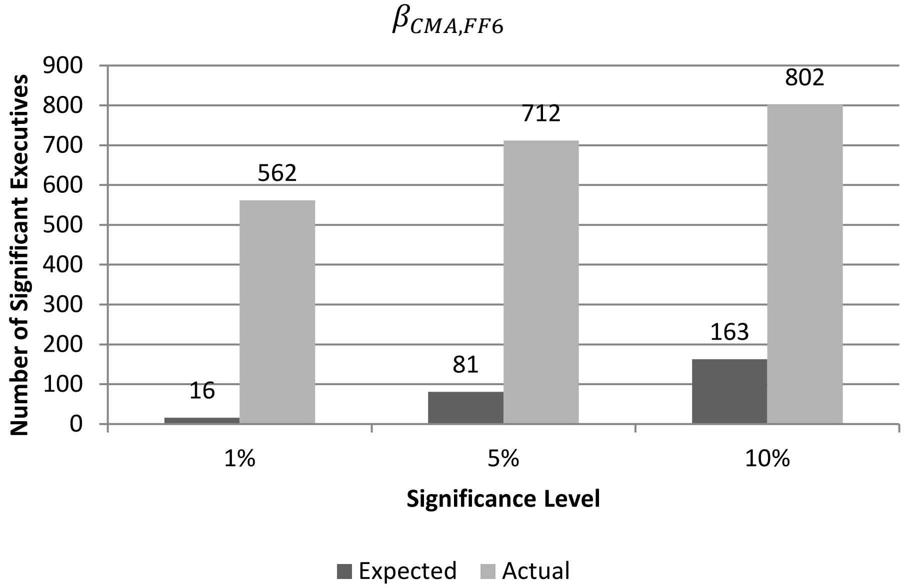


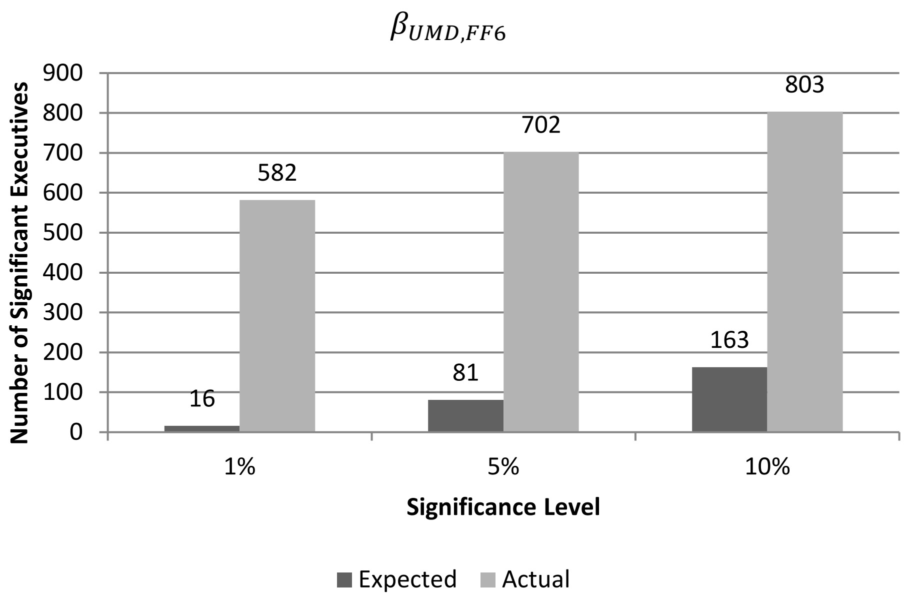


Notes:
Figure A2 reports the actual number of significant manager fixed effects and the expected number of significant manager fixed effects. The significance of manager fixed effects is determined using heteroskedasticity-consistent standard errors clustered at the firm-level.

FIGURE A2 (CONTINUED)

ROBUSTNESS: FAMA-FRENCH SIX-FACTOR MODEL



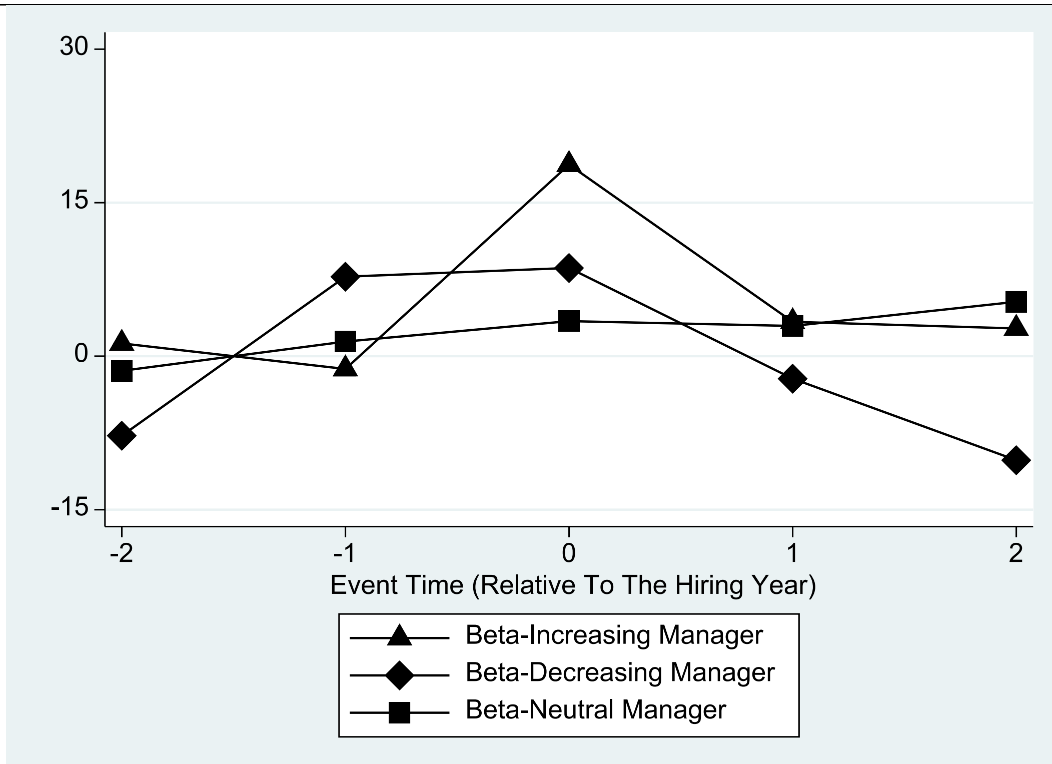


Notes:

Figure A2 reports the actual number of significant manager fixed effects and the expected number of significant manager fixed effects. The significance of manager fixed effects is determined using heteroskedasticity-consistent standard errors clustered at the firm-level.

FIGURE A3

CHANGE IN ASSET SALES SURROUNDING EXECUTIVE TRANSITIONS

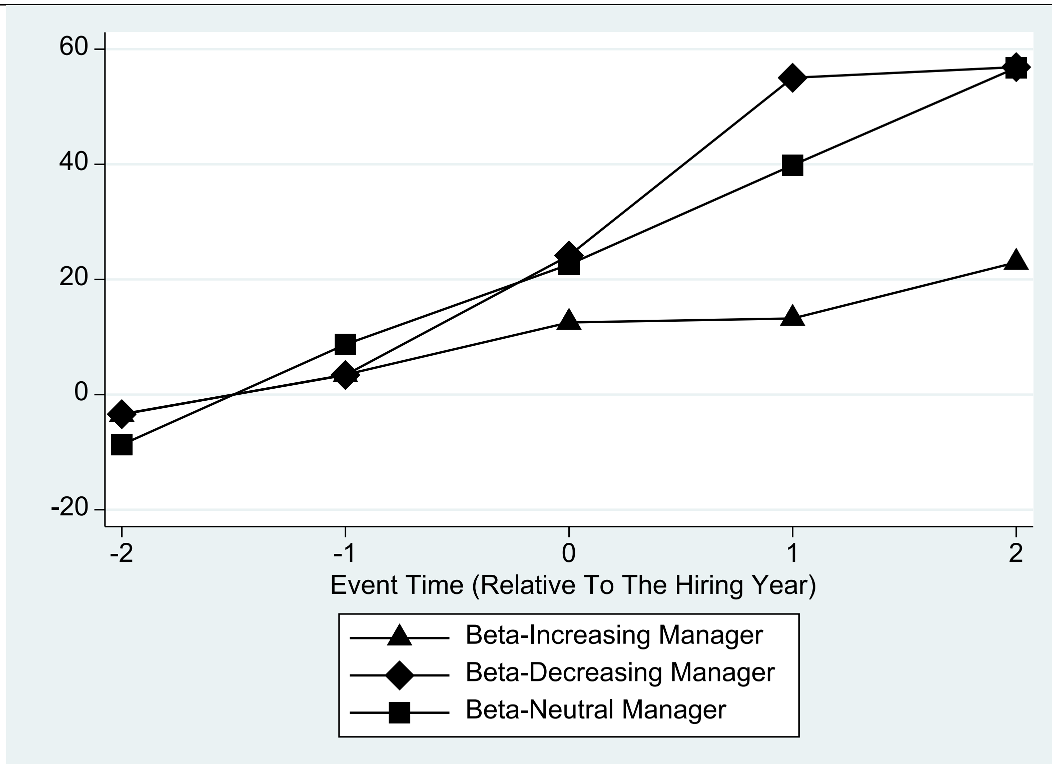


Notes:

Figure A3 plots the evolution of asset sales for three groups: (1) managers with positive fixed effects that are significant at the 5 percent level (*Beta-Increasing Managers)*; (2) managers with negative fixed effects that are significant at the 5 percent level (*Beta-Decreasing Managers*); and (3) managers with fixed effects that are not significant at the 5 percent level (*Beta-Neutral Managers*). Year 0 denotes the hiring year. To construct this figure, we subtract the average value of asset sales measured over the interval [-2, -1] from the raw value of asset sales for each firm-year. Thus, the value of asset sales over the interval [0, 2] represents the change in asset sales from the firm's average asset sales before the executive joined the firm.

FIGURE A4

CHANGE IN R&D SURROUNDING EXECUTIVE TRANSITIONS

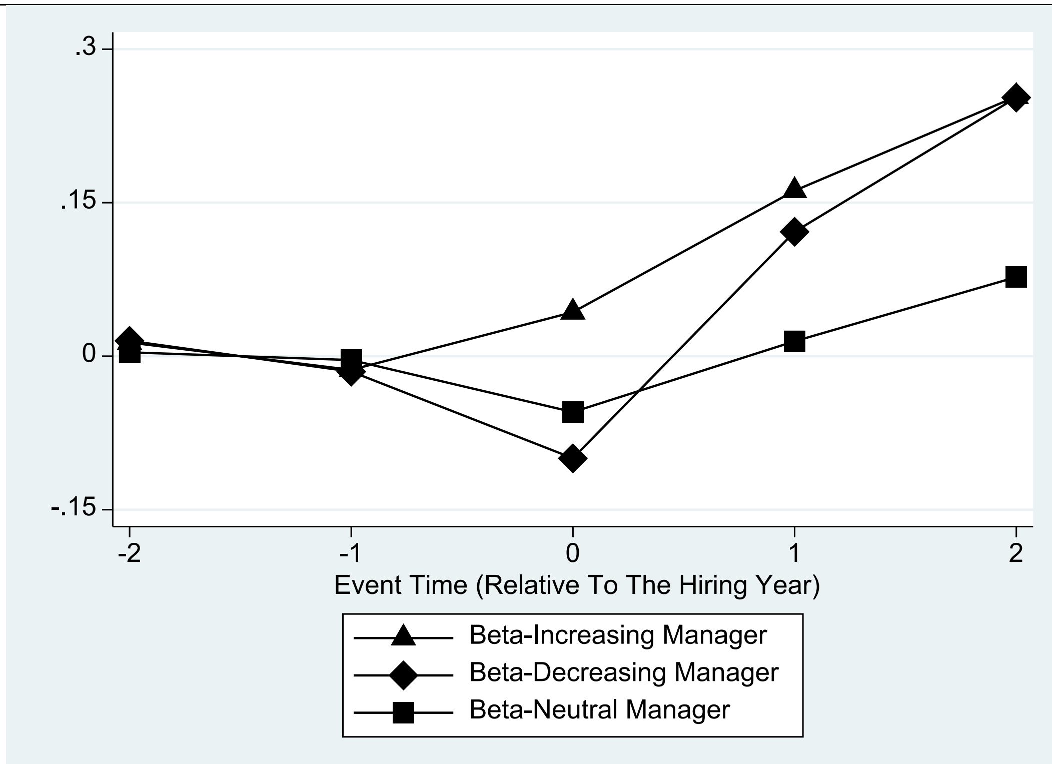


Notes:

Figure A4 plots the evolution of R&D for three groups: (1) managers with positive fixed effects that are significant at the 5 percent level (*Beta-Increasing Managers)*; (2) managers with negative fixed effects that are significant at the 5 percent level (*Beta-Decreasing Managers*); and (3) managers with fixed effects that are not significant at the 5 percent level (*Beta-Neutral Managers*). Year 0 denotes the hiring year. To construct this figure, we subtract the average value of R&D measured over the interval [-2, -1] from the raw value of R&D for each firm-year. Thus, the value of R&D over the interval [0, 2] represents the change in R&D from the firm's average R&D before the executive joined the firm.

FIGURE A5

CHANGE IN NUMBER OF ACQUISITIONS SURROUNDING EXECUTIVE TRANSITIONS

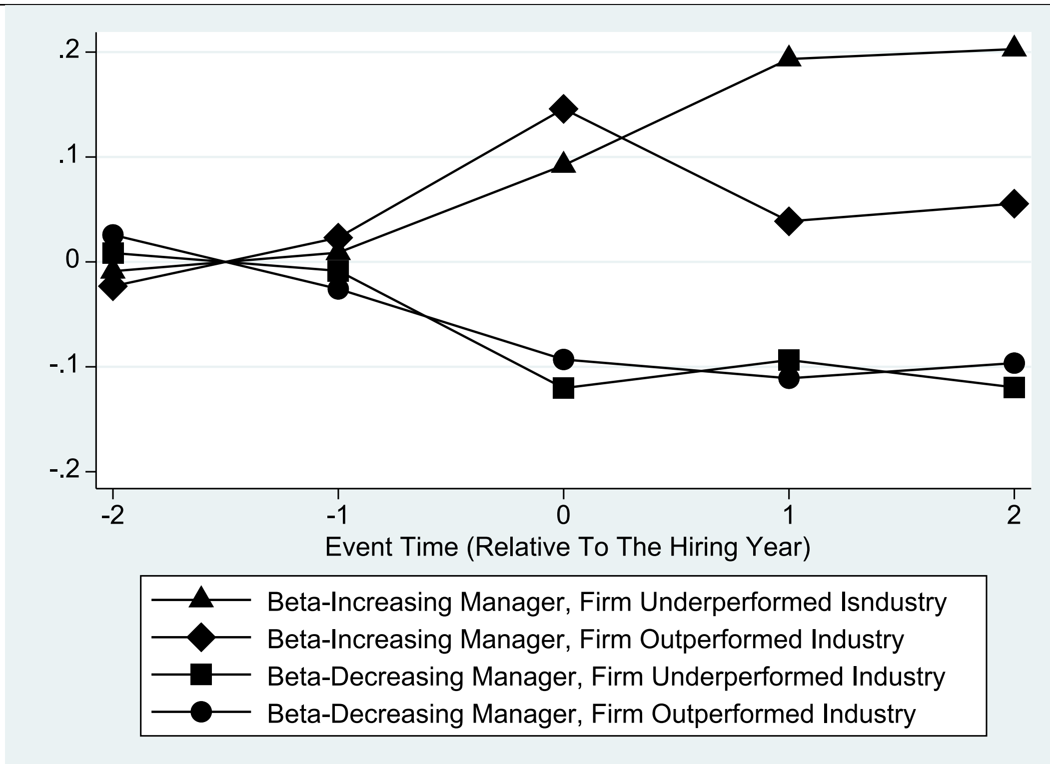


Notes:

Figure A5 plots the number of acquisitions for three groups: (1) managers with positive fixed effects that are significant at the 5 percent level (*Beta-Increasing Managers)*; (2) managers with negative fixed effects that are significant at the 5 percent level (*Beta-Decreasing Managers*); and (3) managers with fixed effects that are not significant at the 5 percent level (*Beta-Neutral Managers*). Year 0 denotes the hiring year. To construct this figure, we subtract the average number of acquisitions measured over the interval [-2, -1] from the raw number of acquisitions for each firm-year. Thus, the number of acquisitions over the interval [0, 2] represents the change in the number of acquisitions from the firm's average number of acquisitions before the executive joined the firm.

FIGURE A6

UNDERPERFORMING INDUSTRY PEERS

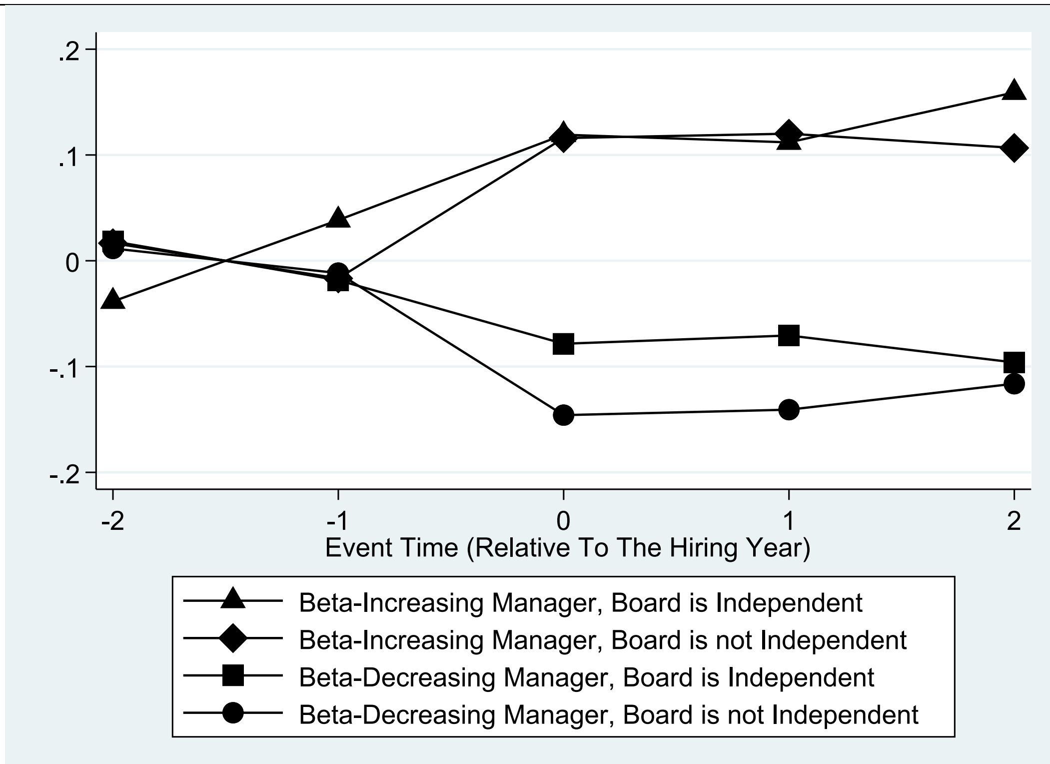


Notes:

Figure A6 plots the evolution of β_{MKT} for four groups: (1) firms that hire a *Beta-Increasing Manager* and underperformed their industry peers in the year before the executive transition, (2) firms that hire a *Beta-Increasing Manager* and outperformed their industry peers in the year before the executive transition, (3) firms that hire a *Beta-Decreasing Manager* and underperformed their industry peers in the year before the executive transition, and (4) firms that hire a *Beta-Decreasing Manager* and outperformed their industry peers in the year before the executive transition. Year 0 denotes the hiring year. To construct this figure, we subtract the average value of beta measured over the interval [-2, -1] from the raw value of beta for each firm-year. Thus, the value of beta over the interval [0, 2] represents the change in beta from the firm's average beta before the executive joined the firm.

FIGURE A7

BOARD INDEPENDENCE



Notes:

Figure A7 plots the evolution of β_{MKT} for four groups: (1) firms that hire a *Beta-Increasing Manager* and have an independent board, (2) firms that hire a *Beta-Increasing Manager* and do not have an independent board, (3) firms that hire a *Beta-Decreasing Manager* and have an independent board, and (4) firms that hire a *Beta-Decreasing Manager* and do not have an independent board. Year 0 denotes the hiring year. To construct this figure, we subtract the average value of beta measured over the interval [-2, -1] from the raw value of beta for each firm-year. Thus, the value of beta over the interval [0, 2] represents the change in beta from the firm's average beta before the executive joined the firm.

TABLE A1

ROBUSTNESS: INFREQUENT TRADING

	F-tests on fixed effects for				
	CEOs	*CFOs*	*Other executives*	*N*	*Adjusted R^2*
$\beta_{MKT,DIMSON}$				23,762	.3247
$\beta_{MKT,DIMSON}$	2.91 (<.0001, 563)			23,762	.3406
$\beta_{MKT,DIMSON}$	3.09 (<.0001, 563)	3.40 (<.0001, 410)	4.98 (<.0001, 655)	23,762	.3716

Notes:

Using the sample of firm-years with non-missing data, we estimate the following regression:

$$Risk_{i\tau} = \alpha_\tau + \gamma_i + \lambda_{CEO} + \lambda_{CFO} + \lambda_{Other} + \varepsilon_{i\tau}$$

α_τ are year fixed effects, γ_i are firm fixed effects, and λ are manager fixed effects. The first row excludes manager fixed effects. The second row includes CEO fixed effects and the third row includes fixed effects for all three groups of managers (CEO, CFO, Other). The middle columns report the results from *F*-tests for the joint significance of the manager fixed effects. For each *F*-test, we report the *F*-statistic, *p*-value, and number of constraints.

TABLE A2

ROBUSTNESS: FAMA-FRENCH SIX-FACTOR MODEL

	F-tests on fixed effects for				
	CEOs	*CFOs*	*Other executives*	*N*	*Adjusted R^2*
$\beta_{MKT,FF6}$				23,768	.2080
$\beta_{MKT,FF6}$	2.76 (<.0001, 563)			23,768	.2178
$\beta_{MKT,FF6}$	2.52 (<.0001, 563)	3.27 (<.0001, 410)	4.39 (<.0001, 655)	23,768	.2383
$\beta_{SMB,FF6}$				23,768	.4196
$\beta_{SMB,FF6}$	3.07 (<.0001, 563)			23,768	.4281
$\beta_{SMB,FF6}$	2.68 (<.0001, 563)	2.64 (<.0001, 410)	5.86 (<.0001, 655)	23,768	.4454
$\beta_{HML,FF6}$				23,768	.2317
$\beta_{HML,FF6}$	2.83 (<.0001, 563)			23,768	.2395
$\beta_{HML,FF6}$	2.56 (<.0001, 563)	3.25 (<.0001, 410)	9.30 (<.0001, 655)	23,768	.2526
$\beta_{RMW,FF6}$				23,768	.2341
$\beta_{RMW,FF6}$	2.35 (<.0001, 563)			23,768	.2399
$\beta_{RMW,FF6}$	2.07 (<.0001, 563)	2.16 (<.0001, 410)	9.28 (<.0001, 655)	23,768	.2546
$\beta_{CMA,FF6}$				23,768	.1244
$\beta_{CMA,FF6}$	2.44 (<.0001, 563)			23,768	.1388
$\beta_{CMA,FF6}$	3.01 (<.0001, 563)	2.35 (<.0001, 410)	9.59 (<.0001, 655)	23,768	.1754
$\beta_{UMD,FF6}$				23,768	.0586
$\beta_{UMD,FF6}$	2.17 (<.0001, 563)			23,768	.0665
$\beta_{UMD,FF6}$	2.38 (<.0001, 563)	3.29 (<.0001, 410)	5.56 (<.0001, 655)	23,768	.0897

Notes:
Using the sample of firm-years with non-missing data, we estimate the following regression:

$$Risk_{i\tau} = \alpha_\tau + \gamma_i + \lambda_{CEO} + \lambda_{CFO} + \lambda_{Other} + \varepsilon_{i\tau}$$

α_τ are year fixed effects, γ_i are firm fixed effects, and λ are manager fixed effects. The first row for each variable excludes manager fixed effects. The second row includes CEO fixed effects and the third row includes fixed effects for all three groups of managers (CEO, CFO, Other). The middle columns report the results from *F*-tests for the joint significance of the manager fixed effects. For each *F*-test, we report the *F*-statistic, *p*-value, and number of constraints.

References

Daniel, K., Titman, S., 1997. Evidence on the characteristics of cross sectional variation in stock returns. *Journal of Finance* 52 (1), 1–33.

Dimson, E., 1979. Risk measurement when shares are subject to infrequent trading. *Journal of Financial Economics* 7 (2), 197–226.

Fama, E. F., French, K. R., 1993. Common risk factors in the returns on stocks and bonds. *Journal of Financial Economics* 33 (1), 3–56.

Fama, E. F., French, K. R., 2015. A five-factor asset pricing model. *Journal of Financial Economics* 116 (1), 1–22.

Fama, E. F., French, K. R., 2018. Choosing factors. *Journal of Financial Economics* 128 (2), 234–252.

Fama, E. F., French, K. R., 2020. Comparing cross-section and time-series factor models. *Review of Financial Studies* 33 (5), 1891–1926.

Lewellen, J., Nagel, S., 2006. The conditional CAPM does not explain asset-pricing anomalies. *Journal of Financial Economics* 82 (2), 289–314.

Merton, R. C., 1973. An intertemporal capital asset pricing model. *Econometrica* 41 (5), 867–887.

Ross, S. A., 1976. The arbitrage theory of capital asset pricing. *Journal of Economic Theory* 13 (3), 341–360.